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**HISTORY**  
OF THE  
**RAILWAYS**  
DURING THE  
**WAR IN SOUTH AFRICA, 1899-1902,**

BY

LIEUT.-COLONEL SIR E. P. C. GIROUARD, K.C.M.G., D.S.O., R.E.,

*Director of Railways, South Africa Field Force.*

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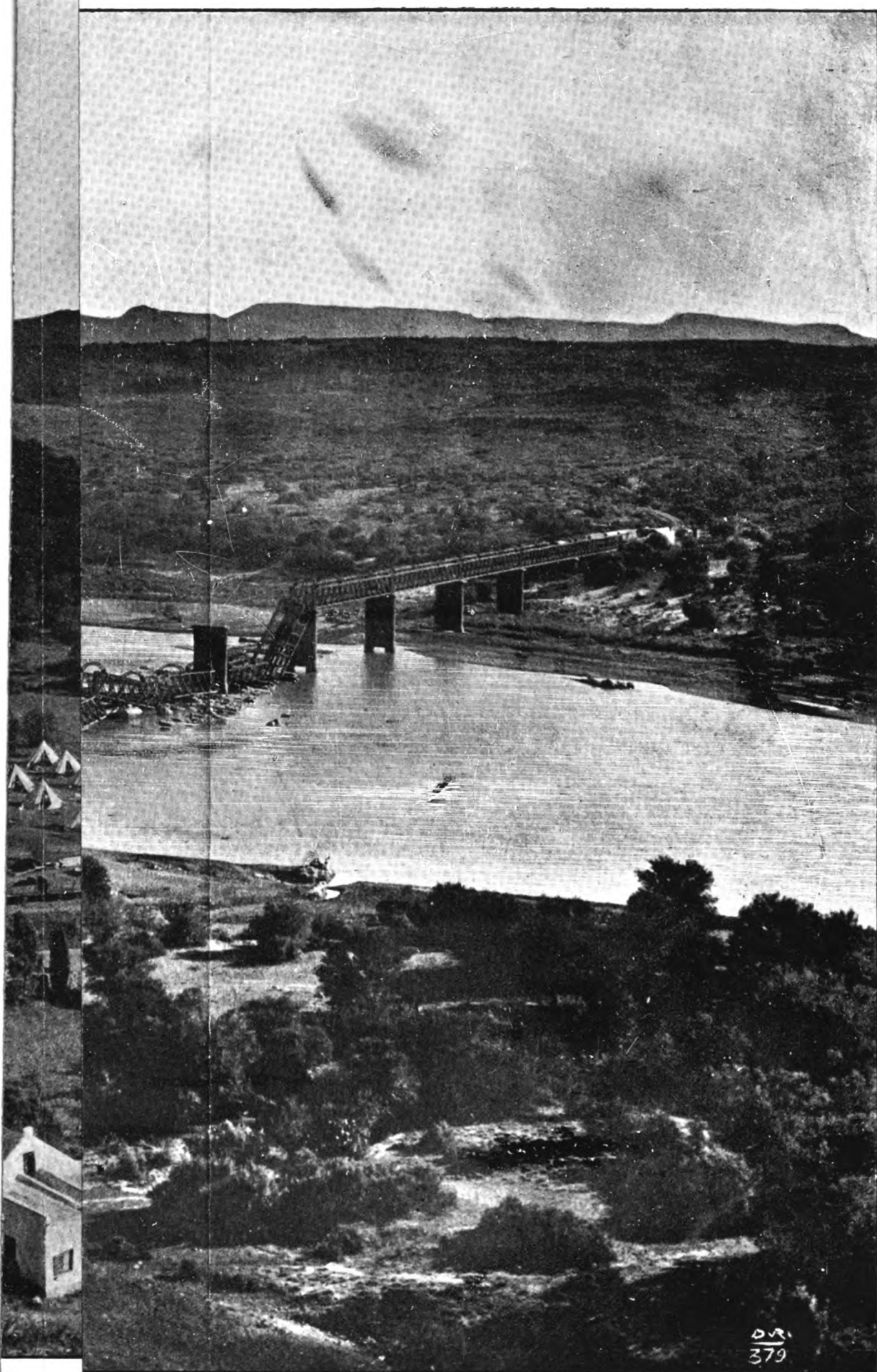
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## CONTENTS.

### HISTORY OF EVENTS.

	PAGE
I.—CREATION OF A MILITARY CONTROLLING STAFF—	
(A) Appointment of a Director of Railways ... ..	7
(B) Existing Military Railway Organisation ... ..	7
(C) General South African Railway Situation ... ..	9
(D) Military Control over the working of friendly railways ...	10
II.—CAPE GOVERNMENT RAILWAYS—	
(A) General Description ... ..	21
(B) Military Controlling Staff ... ..	22
(C) Reconstruction of the Cape Government Railways ...	26
(D) The Railway Pioneer Regiment ... ..	30
III.—NATAL GOVERNMENT RAILWAYS—	
(A) General Description ... ..	31
(B) Military Controlling Staff ... ..	31
(C) Reconstruction of the Natal Government Railways ...	32
IV.—IMPERIAL MILITARY RAILWAYS—	
(A) Imperial Military Railways in the Orange River Colony	33
(1) Creation of Imperial Military Railways ... ..	33
(2) Military Controlling Staff ... ..	34
(3) Organisation of Technical Working Staff ... ..	36
(B) Imperial Military Railways, Transvaal and Orange River Colony combined ... ..	37
(1) Transvaal Railways Incorporated with Imperial Military Railways ... ..	37
(2) Re-organisation of Military Controlling Staff ...	38
(3) Re-organisation of Technical Working Staff ...	38
(3095)	A 2



	PAGE
IV.—IMPERIAL MILITARY RAILWAYS— <i>continued</i> —	
(c) Imperial Military Railway Reconstruction ... ..	47
(1) Creation of the Works Department ... ..	47
(2) (a) Temporary Reconstruction in the Orange River Colony... ..	48
(b) Semi-Permanent and Permanent Reconstruction in the Orange River Colony... ..	49
(3) Reconstruction in the Transvaal ... ..	49
(4) Summary of Railway Engineering Work ... ..	49
(5) New Construction ... ..	50
(6) Experience gained ... ..	50
(d) Imperial Military Railways Locomotive Department ... ..	51
(1) Creation of the Locomotive Department ... ..	51
(2) Work in the Orange River Colony ... ..	51
(a) Temporary Work in following up the Army ... ..	51
(b) Workshops and Rolling Stock ... ..	51
(3) Work in the Transvaal ... ..	51
(a) Taking over of the Transvaal Railways ... ..	51
(b) Temporary Work in following up the Army ... ..	52
(c) Workshops and Rolling Stock ... ..	53
(4) Summary of Work of the Locomotive Department ... ..	56
(5) Conclusions ... ..	56
(e) Imperial Military Railways Traffic Department ... ..	56
(1) Creation of the Traffic Department ... ..	56
(2) Temporary Traffic Arrangements following up the Army ... ..	57
(3) Resumption of Traffic on Transvaal Railways ... ..	58
(4) Summary of the Work of the Traffic Department ... ..	59
(5) Experience gained ... ..	61
(f) Imperial Military Railways Telegraph Department ... ..	62
(1) Creation of and Necessity for a Railway Telegraph Department ... ..	62
(2) Work of the Telegraph Department... ..	62
(g) Imperial Military Railways Stores Department ... ..	63
(h) Imperial Military Railways Accounts Department ... ..	63
(k) Minor Departments. Imperial Military Railways ... ..	63
(1) Railway Medical Department ... ..	63
(2) Railway Staff Dépôt ... ..	63
(3) Employment Office in Cape Town ... ..	63
(4) Railway Police... ..	64
(5) Appointment of an Assistant Director of Railways, Lorenzo Marques ... ..	64

V.—THE ORGANISATION AND USE OF ARMOURED TRAINS ...	PAGE 64
VI.—ORGANISATION OF THE ARMY LABOUR DEPÔT ... ..	66
VII.—MISCELLANEOUS ... ..	67

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### APPENDICES.

(A) Table showing distances of Principal Military Stations used during operations from the Base Ports... ..	68
(B) Some extracts from Army Orders affecting railway working... ..	69
(C) Tables showing details of Temporary, Semi-permanent, and Permanent Repairs to the Cape Government, Natal Government, and Imperial Military Railways	83
(D) Tables showing minor interruptions to railway traffic, due to the Enemy, from June 6th, 1900, to July 4th, 1901 ... ..	129

## PHOTOGRAPHS.

Panorama double Photograph of Norvals Pont, destroyed. *Frontispiece.*

„ „ „ repaired. „

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## DRAWINGS.

Railway Map of South Africa ... .. *To face page 3.*

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## CHARTS AND DIAGRAMS.

Chart showing organisation established until December, 1900 ... .. *To face page 46*

Chart showing re-organisation ... .. „ 46

Diagram showing number of breaks to line on the Imperial Military Railways, from June, 1900, to June, 1901, inclusive ... .. „ 142

Diagram showing number of breaks to line on the Imperial Military Railways, from June, 1901, to April, 1902, inclusive ... .. „ 142

## I.—CREATION OF MILITARY CONTROLLING STAFF.

### (IA.)—APPOINTMENT OF A DIRECTOR OF RAILWAYS.

On the 7th October, 1899, the Commander-in-Chief appointed Captain and Brevet Major E. P. C. Girouard, D.S.O., R.E., at that time President of the Egyptian State Railways, to be Director of Railways for the South African Field Force, with the local rank of Lieut.-Colonel.

### (IB.)—EXISTING MILITARY RAILWAY ORGANISATION.

The sole military railway organisation existing in peace time in England consisted of two railway companies Royal Engineers (war strength about 150 each). Of these the 8th Company had proceeded to South Africa in July, 1899. No staff existed, even on paper.

The Director's first step was to augment the railway organisation at his disposal with the view of obtaining :—

First—A staff to control the existing railways in British South Africa. (Military Railway Controlling Staff.)

Second—Sufficient railway troops for the rapid reconstruction of damaged railway lines.

Third—(Field Railway Sections). A nucleus of staff to take over the working of railways in the enemy's country. These were eventually known as the Imperial Military Railways.

With this object in view, the services of officers of the Royal Engineers with railway experience were asked for.

The following officers received orders, from time to time during the campaign, to report to the Director of Railways, viz. :—

Major R. S. Maclagan, R.E. (Indian Public Works Department).

Major J. E. Capper, R.E. (Indian Public Works Department).

Major C. H. Cowie, R.E. (N.W. Ry., India).

Capt. V. Murray, R.E. (Burma State Railways).

Capt. H. C. Nanton, R.E. (previously employed on railway construction, India and Canada).

Capt. W. S. Nathan, R.E. (previously employed on railway survey in China).

Capt. J. H. Twiss, R.E. (previously employed on railways in India).

Capt. W. D. Waghorn, R.E. (previously employed on railway construction, India).

Capt. W. V. Scudamore, R.E. (previously employed on railway construction, India).



- Capt. J. M. Burn, R.E. (previously employed on Indian railways).  
 Capt. E. D. Swinton, R.E. (Assistant Instructor in Fortifications, Chatham).  
 Capt. H. A. A. Livingstone, R.E. (served in South Africa).  
 Capt. G. Lubbock, R.E. (previously employed on Indian railways).  
 Lieut. E. H. M. Leggett, R.E. (Traffic Manager, Woolwich Arsenal).  
 Lieut. A. G. Stevenson, D.S.O., R.E. (Locomotive Superintendent, Soudan Railways).  
 Lieut. M. G. E. Bowman Manifold, R.E. (previously employed on telegraphs in England and the Soudan).  
 Lieut. H. L. Pritchard, D.S.O., R.E. (previously employed on railway survey and construction, Soudan and Cyprus).  
 Lieut. H. A. Micklem, D.S.O., R.E. (previously employed on railway construction, Soudan).  
 Lieut. E. O. A. Newcombe, R.E. (Assistant Locomotive Superintendent, Soudan).  
 Quartermaster and Hon. Lieut. A. N. Tucker, R.E.  
 Quartermaster and Hon. Lieut. G. Taylor, R.E.  
 Quartermaster and Hon. Lieut. R. Friar, R.E.

Of the above list, fifteen officers joined the Director almost immediately on the outbreak of war, the others joining later during the progress of the campaign.

The railway troops were augmented, first, by bringing the 8th and 10th Companies up to war strength, and second, by placing at the disposal of the Director of Railways the 31st and 42nd Fortress Companies for railway work.

Having thus arranged, as far as possible, for a staff of officers and men with railway experience, the next step taken at home was to inquire into the stores and materials available in South Africa.

To obtain all possible information concerning the South African railways, a visit was paid to the Agents-General of the Cape and Natal Governments and the representatives of the Orange Free State Railways, who willingly furnished a considerable amount of useful information as to the types of bridges, rolling-stock, &c., as also the amount of material which might be found available in South Africa for railway repairs.

As a result of this information some forty to fifty girders were at once ordered of the same type as those in use in the Cape and Orange Free State, as also sufficient timber of useful dimensions to reconstruct in a temporary manner the whole of the bridges of the Orange Free State, assuming them to have been destroyed, which proved to be the case.

On October 8th, 1899, the Director of Railways asked the Secretary of State for War to send a telegram to the High Commissioner in South Africa, stating that all British employés on the Orange Free State Railway Administration who resigned their appointments and came into the Cape Colony to serve with the Imperial Military Railway Department, would receive the full pay of their appointments during the war, and would be restored to their appointments at its close. This telegram was never received by the Free State Railway employés.

Leaving Major Capper, R.E., in charge in London to see that stores were despatched, the Director of Railways proceeded to South Africa on the 7th October, with seven of his staff, landing in Cape Town on the 23rd.

The 8th Railway Company, as stated, was already in South Africa; the 10th Railway Company arrived in South Africa on the 16th November, 1899; the 31st Company arrived on the 13th November, 1899; and the 42nd Company arrived on 27th November, 1899; the whole available strength of Royal

Engineer Railway Troops being about 500. At a later date these were augmented by the 6th and 20th Fortress Companies, Royal Engineers.

(Ic.)--GENERAL SOUTH AFRICAN RAILWAY SITUATION.  
(November, 1899.)

The railways of South Africa, which are in direct inter-communication with one another, have a mileage of 4,648 miles, divided as follows:—

(1) IN BRITISH SOUTH AFRICA—					Miles.
Cape Colony—Cape Government Railways	...	...	...	...	1,987
Rhodesia—Rhodesia Railways (worked by the Cape Government)	...	...	...	...	587
Private Railways in Cape Colony	...	...	...	...	126
Natal Government Railways	...	...	...	...	567
Total under British control	...	...	...	...	3,267
(2) IN THE ORANGE FREE STATE AND TRANSVAAL—					
Orange Free State Government Railways	...	...	...	...	392
Netherlands South African Railway Company	...	...	...	...	741
Pretoria-Pietersburg Railway Company	...	...	...	...	177
Total	...	...	...	...	1,310
(3) IN PORTUGUESE EAST AFRICA—					
Delagoa Bay Railway	...	...	...	...	55
Total mileage	...	...	...	...	55
					<hr/>
					4,632
					<hr/>

Of these railways, the most important in military operations would be those leading direct from the ports towards the supposed theatre of operations, namely, the Western line of the Cape Government Railways from Cape Town to De Aar and Kimberley; the Midland line of the Cape Government Railways from Port Elizabeth to Norvals Pont; the Eastern line of the Cape Government Railway from East London to Bethulie; the Natal Government Railways from Durban to the borders of the two Republics; and finally, the Portuguese Railway, which, however, was not available for obvious reasons at the outbreak of the war, and possibly the Beira Railway to Salisbury.

In the enemy's country the Orange Free State Railways and those of the Netherlands Railway Company would be of great importance.

Examining the condition of affairs immediately after the Director of Railways landed in South Africa in November, 1899, it was found that the enemy were in occupation in the Cape Colony of all lines north of the Orange River, and were holding the important bridges across this river at Bethulie and Norvals Pont—the bridge at Orange River remaining in our hands. In Natal the enemy held the line of railway almost to Ladysmith, and, having invested that place, were in occupation of the line to the south of it as far as Chieveley, our outposts being at Frere. Thus the Cape Railways were cut off from some 700 miles of their system, which was, however, worked more or less regularly as from Bulawayo to Gaborones; and the Natal Government Railways had lost control of 201 miles. Both lines had suffered some loss of rolling stock and engines, but, as their mileage had decreased, the possible carrying power could not be said to have been greatly affected—more so probably in the Cape, where large numbers of engines remained in the beleaguered towns of Kimberley and Mafeking—whereas, in Natal most of the

stock had been removed south of Ladysmith before the final investment. All the British lines were in good working order and administered by a highly loyal, capable, and enthusiastic staff prepared for any emergency, including risks of war.

Looking beyond, into the enemy's countries, the lines of the Free State were administered largely by an English staff, which had been handed over with the line, on its transfer from Cape Government management in 1897. Before the declaration of war, a large proportion of the employes left the country, but a certain proportion remained behind. In the Transvaal, the Netherlands Railway Company employes to the number of over 2,000, mainly Hollanders, were known to be actively hostile, and afterwards proved to have acted practically as belligerents.

The questions to be answered were therefore :—

- 1st. What amount of control on the working of lines in British territory should be exercised to meet the wants of the Army ?
- 2nd. How, and by whom, should the rapid and temporary reconstruction of the British railways be carried out ?
- 3rd. What system should be adopted with regard to the working of lines in the enemy's country, if they fell into our hands ?

The first two problems had, as mentioned before, been considered both in London and on board ship during the Director of Railways' passage to South Africa. They were now reconsidered in communication with the Cape Government Railway officials.

The third eventuality, being dependent largely upon the attitude which might be taken up by the staffs of the railways, was not definitely decided upon at this date.

### (ID.)—MILITARY CONTROL OF THE WORKING OF FRIENDLY RAILWAYS.

Never, prior to the South African Campaign, has the British Army been required to control a vast network of railways largely through hostile country, and with innumerable columns or other detached forces using it as a base along many thousands of miles.

On Lieutenant-Colonel Girouard's appointment, the then Commander-in-Chief, Lord Wolseley, had thoroughly approved the Director of Railways' view that an intermediate controlling staff, in close touch with the traffic officials of the various railways, was essential.

During peace the amount of traffic between certain points on the railway is known, and the traffic regulations drawn up to deal with it remain the same for considerable periods. It is known where most rolling stock is required, and therefore where most sidings are wanted. Arrangements can thus be made to utilise the rolling stock to the utmost without any check on the flow of traffic. Everything proceeds by routine ; the increase of traffic at any point can be foreseen some time before it occurs. The railway authorities in peace time are paramount on the railway, and tolerate no interference from anyone.

On the other hand, in war time, the centres of traffic, on account of which the railways have been planned, are suddenly and entirely altered. Fifty thousand men may require to detrain at a roadside station, whence large quantities of stores must also be despatched. One loop siding suddenly becomes a terminus of the railway, to which trains from several ports are converging. Similarly, the usual runs for locomotives are quite upset. Important watering stations are either destroyed or are not approachable, with the result that great difficulty is experienced in keeping engines supplied with water.

Engine drivers and guards, owing to derangement of traffic, are

frequently forced to work abnormally long hours, and engines are kept running when they should be in the shops for repairs.

Military commanders who have not previously studied the working of a railway attempt to seize and work the portion of line nearest to them, regardless of the remainder of the system. They often look upon trucks as another form of commissariat wagon, which may be kept loaded for an indefinite period. They expect trains to stop and off-load or load on the main line. They like to have a number of trains standing ready, either loaded or unloaded, in case they should be required. They are apt to give orders for large entrainments and detrainments to be carried out at any point on the line, regardless of the railway facilities at that point, although perhaps a suitable place is within reasonable distance. Frequently they have been known to countermand their orders for entrainments, heedless of the fact that once arrangements have been made to concentrate rolling stock on a certain place, it takes time to alter these arrangements, and is sure to cause confusion. Many of them expect railway accommodation for troops to be on a liberal scale, and consider that there is no necessity, when close to a railway, to make any effort to cut down baggage and stores.

They have sometimes attempted to use the railway to move troops short distances of twenty or thirty miles, forgetting the fact that, roughly speaking, large bodies of mounted troops will march eighty miles, and infantry forty miles, more quickly than they can be trained, unless unusual facilities for railway transport happen to exist at that particular moment, and at that particular spot; also regardless of the fact that these local troop movements keep rolling stock locked up in the district, instead of travelling to and fro between the railway termini.

Some military commanders did not at first grasp the fact that once the railway has carried troops up to the front it should be used mainly for carrying stores and supplies from the base to the advance depôts from which the transport works, and that any attempt to use the railway as a first line of transport, following the forces, halting when they halt, is unsatisfactory to the force and paralyses the railway. Of course there are occasions when the railway is invaluable for making big strategic changes of front, such as Lord Roberts' concentration near Modder River, and this is one of the primary uses of a railway during war, but it must be clearly understood that stores cannot be pushed up at the same time.

Commandants of posts on the line, which are very often placed at railway stations, are inclined to think that because they are called "station commandants" it means that they are in charge of the railway station, and can give orders to railway officials as to traffic and other matters.

It may appear that the above remarks, pointing out the manner in which the Army unwittingly interfere with railway administration are somewhat exaggerated, but this is not the case.

Further proof that this interference will always occur, unless guarded against, is furnished by a very valuable work published shortly after the Franco-Prussian war, dealing also with the Austro-Prussian war, a work which would amply repay perusal by any staff officer, but one which has generally escaped attention, "*Les Chemins de Fer pendant la Guerre de 1870-71*, par M. Jacquin." It shows how the French Army in 1870 made no arrangements to ensure the proper working of the railway unhindered by their own forces, and in consequence their railway administration was thrown into hopeless chaos, whereas the Germans from the very outset issued most stringent regulations, by which, not only did the Director of Railways become absolutely paramount on the railway, but also all his subordinate staff, scattered over the railway system, were paramount in their own particular stations or districts, taking orders from the Director of Railways only, and no military commander could under any circumstances interfere with the railways without incurring a rebuke from headquarters, except when fighting was actually in progress at a station. This will show that the tendency to interfere with railway working is not confined to our own Army, but will always occur, wherever the campaign may be. Civil railway officials have been heard to say that attacks by the enemy on the line are not nearly so disturbing to traffic as the arrival of a friendly general with his force.

From this lengthy volume by Monsieur Jacqmin the following extracts are given :—

*Extracts from Monsieur Jacqmin's Book.*

"There has been no lack of discussion regarding the importance, in time of war, of the transportation of men and material. Modern warfare brings together armies of several hundreds of thousands of men whom it is necessary to concentrate, to carry, to supply with food and equipment, and the number of problems, apparently irrelevant, requiring solution in order to ensure success to the military operations, is to-day considerable. It is undoubtedly in peace time that these problems should be taken up, discussed and solved. If we wait until war is on us, we at once fall into the confusion which leads to disaster.

"One merit of the French soldier has been considerably praised : it is said that he can look after himself anywhere. This may be true in a campaign carried out by a few hundreds or thousands of men ; but it is no longer true when it is said of an army two or three hundred thousand strong. Let these men be as wonderfully gifted as could be wished, their bravery will be entirely nullified if their food is late, or their ammunition badly distributed.

"By a fatality for ever to be regretted, France had not, for the war of 1870, any real organisation for military transport by rail, while Germany possessed one as perfect as possible.

"In France there had been two attempts to devise an organisation : one on a large scale, before the war, by order of Marshal Niel ; the other later, at the time when the war was coming to a close, by order of M. de Freycinet, Minister of War at Bordeaux. But during the war itself, we are compelled to say that there was nothing at all of this nature ; everybody in command gave orders, and the railways found themselves constantly saddled with instructions either of a contradictory or impossible nature.

"The attempts at organisation to which we have referred, both rested upon one initial idea : *the union of the military element, and of the technical element.* To the military element belonged the supremacy—that should be indisputable : but no move of men or material should be ordered without having been first arranged and discussed with the competent men who represent the technical element.

"After Marshal Niel's death the subject apparently dropped, and at the time war was declared it seems that no one remembered that any scheme had been prepared. The railways received simultaneously, from the Commissariat, from the Quartermaster-General's Department, from the Artillery, from the Engineers, orders which, being given independently, caused the direst confusion.

"It is impossible for those who were not spectators to realise the confusion which existed during the concentrations on arrival at Metz and Strasbourg, and which is fully authenticated by all the accounts which have been published on these sad events.

"Each authority acted in a confined zone, without concerning himself with what was taking place in the next. 'I despatch because they tell me to despatch,' said one official to us. 'I do not trouble myself with what will happen on arrival at destination.' Again, in this further respect, great mistakes have been committed. *Moves were ordered to be carried out by rail, which by road would have been completed more surely, even more quickly,* particularly in the sense that the units of an army corps, instead of being scattered over a long line, would by road have remained concentrated together.

"If the organisation was at fault from the commencement, one can imagine what it became after our disasters.

"The railways had made unheard-of efforts to comply with the demands made on them, and at all places in the country they carried out moves which would formerly have been judged impossible ; but on many occasions they have been fettered by the want of cohesion among those giving orders. The decree of the 28th January, 1871, was an attempt to remedy this state of things, but it came too late.



"Alongside the difficulties which we encountered, we have unhappily met in our adversaries the most complete organisation imaginable.

"This organisation was no secret. Its principal features were given in printed documents obtainable without difficulty at Berlin or at Vienna, even at Paris itself.

"(On the employ of railways in war-time—Translated from the German. Paris, Dumaine, 1869.)

"For the Austro-Hungarian army in particular, there existed a pamphlet published at Vienna in 1870, which appears to foresee all that is necessary for the movement of armies by rail.

"All these regulations start from the principle which we have given, viz., the intimate association of the military element and the technical element. They provide for the creation—

"1st. At Berlin or at Vienna, of a central committee whose duty is to study and prepare solutions.

"2nd. At all places where deemed necessary, of subordinate committees ('commissions de ligne') composed of a staff officer and a higher official of the railway, whose duties are to arrange moves under the supervision and after receiving the orders of the central committee or its delegates.

"In France we had all that: the central committee, proposed by Marshal Niel, was itself the central committee of the Germans; the subordinate committees which had been provided for would have been the 'commissions de ligne.' The regulations already prepared would have been completed, and we could easily have applied on French territory a collection of measures similar to those in force among foreign nations.

"But what has not been done it is necessary now to do; we have on this point the firmest conviction, and we have considered it a duty to endeavour to place this conviction before the public.

"It has seemed to us that it will be sufficient to show what actually happened during the last war upon our railways. A portion of these railways had the misfortune to be worked by the Germans, and we have seen working in our own country a complete system of military railway organisation.

"Our work divides itself into six parts—

"(1) The laws and regulations relating to the working of the railways in war time in France. The work of Marshal Niel's committee.

"(2) The German and Austro-Hungarian organisations for military rail transport, central committees, subordinate committees, station commandants.

"(3) Use of the railways by the French armies in 1870-71.

"(4) Use of the railways by the German armies in 1870-71.

"(5) Defence, destruction and re-construction of the railways. Formation of special corps in France and Germany.

"(6) General conclusions.

"In the first five parts we have endeavoured only to narrate facts, leaving to our readers the necessity of drawing conclusions and applying them. In the sixth and last we have tried to lay down conclusions. Nevertheless, on the subject of these conclusions, we must make an important reservation: the railways constitute an additional weapon in the hands of the soldier, but they relieve him in no way from the general studies which are indispensable to him—often they impose upon him fresh duties.

"To-day they attack the great railway companies; they talk incessantly of their tyranny, of their monopoly, of their powerlessness to satisfy the wants of the country, of the necessity of forming all over France new companies. It has not seemed out of place to us to enumerate the services which the great companies carried out for the country in the last war. It is because each of these companies owned more than 20,000 vehicles, because each of them had a *personnel* of some 20,000 to 30,000 men, disciplined, intelligent and energetic, that they were able to make up to a certain extent for the hesitation and confusion shown and caused by those in authority.

If we can imagine the great companies broken up and replaced by innumerable small ones, none of the great military movements which were carried out would have been possible. In the general confusion into which our unhappy country has fallen, how many institutions, with the exception of the Bank of France and the great railway companies, are now in existence, virile, always ready, and always advancing."

\* \* \* \* \*

"Lastly, the carrying out of the measures which we think it right in our conclusions to propose, incurs only the smallest expense. Nearly all can be done without asking for the least sacrifice from the Budget. Men, and intelligent men, are numerous among us. What they require is guidance, then study and foresight. We hope in all that relates to the question of military transport by rail, to show the means of ensuring to our country these studies and this foresight. It is with them that nowadays victories are gained."

One more extract from another source is quoted, as it bears so directly on this subject. It is taken from an article in the "Railway Magazine" of May, 1901, written by a leading English railway official.

*Extract from "Railway Magazine," May, 1901.*

"In the Austro-Prussian war of 1866, although on both sides the organisation of transport by the railways was good in theory, *there was an absence of that free communication between the military authorities and those entrusted with the actual working of the railways which must always be so necessary, and there was no supreme controlling body having a complete grasp of the supply of rolling stock throughout the country. The result was that there was frequently an unnecessary accumulation of vehicles at one point, while at another everything would be at a standstill for want of rolling stock. Moreover, vehicles were frequently allowed to remain under load in large numbers, and block up the available siding room, instead of being promptly unloaded to be returned and used again and again*

"In the Franco-German war of 1870, it was evident that the Germans had, to some extent taken to heart the lessons of the war of 1866, for their railway transport arrangements worked fairly well, and the various 'Line Commissioners' who were charged with the transport, had each attached to them a special bureau for the control and distribution of the rolling stock. But still there was the cardinal mistake of having no *central* bureau having a grasp of the whole, so that one Line Commission might be overstocked with vehicles, while another was hampered for want of them. There was still, moreover, a great want of promptitude in unloading and returning vehicles; and it was clear that one crying need was a supreme central administration for the transport of troops and stores generally. The Germans are, however, a practical people, and eager to profit by the lessons of experience, so that as the war progressed their methods improved, and before its end approached, the transport arrangements were working smoothly and well. Magazines were formed at various convenient points into which the wagons could be promptly unloaded and returned for reloading, and as a result the daily supplies of food, forage, and munitions of war were well maintained. On the side of the French, although there was a very complete system of railways, and a plentiful supply of rolling stock, and the railway officials displayed the greatest energy in carrying out the operations required, *they were hampered at every turn by the want of a proper understanding with the military authorities, and between the headquarters staff and the officers commanding at the front. Thus contradictory orders were frequently given, and great confusion prevailed, with the result that in the great military centres for weeks together, the main lines, the sidings, and even the lines leading to the locomotive sheds—which it was so important to keep clear—were hopelessly blocked with loaded wagons, which in the end fell into the hands of the enemy. Strained relations are said to have prevailed between the military authorities and the civilian railway staff throughout the campaign, and this*

state of things, combined with the want of some central authority on the lines of communication, having general control of the arrangements for the movements of troops and supplies, doubtless led to all the troubles that ensued.

"In the Russo-Turkish war of 1877-8, railway transport did not count for much, for although railways were available in both countries they were so few in number, and so badly equipped, and the arrangements for working them were so wretchedly organised, that they broke down utterly, and the railways might almost as well have been non-existent."

### MILITARY CONTROLLING STAFF (CONCLUSIONS).

Enough has now been said to point out the necessity, which the Director of Railways saw from the first, of having a staff of officers whose duty it would be—

- (a) To keep the military commanders fully informed of the capacity and possibilities of the railway, and to convey their orders and requests to the civil railway staff.
- (b) To protect the civil railway administration from interference by military commanders and commandants of posts; in fact, to act as intermediaries between the Army and the civil railway officials.

The correctness of this has been conclusively proved by the experience gained in the campaign.

The necessity for its existence is not so obvious when troops are being railed straight from the sea to the front as when operations are in progress all over the railway system, and troops are railed from one point to another, backwards and forwards, while the line is being constantly interrupted by the enemy.

The valuable opinions of such experts as the General Manager and the General Traffic Manager of the Cape Government Railways, and Mr. Hoy, Traffic Manager, Imperial Military Railways, in which their subordinates concur, confirm the necessity of an intermediary military staff.

It has also been conclusively proved that railway staff officers must belong to the Director of Railways' department and be under his orders, and not be on the staff of the officers commanding lines of communication. Both systems have been tried, and after nearly two years' trial the Commander-in-Chief decided on placing the railway staff officers under the Director of Railways.

Again, it is absolutely necessary that the Director of Railways' staff should be paramount on the railway, and that no officer should be able to give any orders to railway staff officers or other railway officials, unless fighting is actually proceeding at that spot. This was the system adopted with great success by the Germans, the want of which caused such chaos on the French railways, and the correctness of which has been entirely established by the experience of this war. It is not too much to say that unless it had been adopted in South Africa, the chaos would have been past belief.

The existence of an intermediary controlling staff, whose duties are clearly defined later, established a uniformity of administration throughout the whole of the railway system, to which both the railway officials and the Army became accustomed. It enabled correct accounts to be kept between the Army and the railway officials, while both were aware from whom orders should be obtained, and, by becoming acquainted with the personnel through whom the orders were transmitted, mutual understanding and hearty co-operation resulted.

The system did not have the same exhaustive trial in Natal as on the other systems, since the railway difficulties were far fewer; consequently the necessity for an intermediary staff was not so clearly proved in Natal as elsewhere, for the following reasons:—

The railing of troops backwards and forwards, from point to point, rarely

occurred in Natal. The troops, whose numbers never exceeded 40,000, as compared with about 200,000 on the other side, were transported straight from the sea to railhead, a distance of 170 miles, and rarely afterwards travelled on the railway, with the exception of General Hunter's division, which was sent direct from railhead to the sea, and again when re-invasion was threatened by Botha. Again, they were practically free from attacks from the enemy on the line, in fact they were working in a friendly country, as is shown by the fact that up to May, 1901, the line was only broken seven times after it had been recaptured, as compared with 296 times on the Imperial Military Railways.

A list of these breaks in Natal will be found in Appendix D.

In addition to the fact that the total length of line in Natal is only 400 miles, and the number of troops being supplied never exceeded 40,000, the advance of the Army was conducted with much less rapidity, and therefore the railway had far more time at its disposal. While the railhead on the Imperial Military Railways advanced from Bloemfontein to Vereeniging, a distance of 212 miles, in five and a half weeks, the Natal railhead was only required to move 67 miles. Also in Natal the Army was directly in front of the railway and not scattered about all along it. When the circumstances were similar on the Cape Government Railway and Imperial Military Railways, and only stores had to be railed up, the difficulties were hardly noticeable. It was when large railway concentrations took place, and when the operations extended all over the railways, that the system adopted was thoroughly tested and found to be successful, and in the highest degree necessary.

The system of control of railways was naturally not perfected at once. It took time to correct initial mistakes and gradually to evolve the most suitable regulations. It may be said that a final solution was arrived at about September, 1900. From this time on the Commander-in-Chief was kept informed daily of the exact state of traffic all over South Africa, both as regards troop trains and goods traffic, so that he could, if he desired, alter the destination of troops or stores without difficulty.

The following returns are samples of those sent to the Commander-in-Chief daily, and are copies of some actually rendered.

These were compiled from the telegrams sent by the military controlling staff.

## SPECIMEN OF DAILY TROOP MOVE REPORT HANDED TO THE COMMANDER-IN-CHIEF.

3rd June, 1901.

(3095)

Tels.	Corps.	Officers.	Men.	Horses.	Mules.	Oxen.	Wagons.	Left.	Destination.
1, 3, 4	Col. Hamilton's column, 5th D.G.'s..	4	100	17	..	..	6	SFN, BFX, KDX, VE, 1.10 a.m.	GD, HGX, EFN, KGX
2, 6	" " Q R.H.A...	2	45	10	..	..	..	" " " 2.20 a.m...	KGX, 9.40 a.m.
	" " 64 R.F.A.	1	46	..	..	..	..	" " " " " "	
5	" " " " " "	..	..	..	..	30	13 2 guns	" " " " " "	KGX, 2.45 a.m.
7, 12, 20, 23	" " 5th D.G.'s	5	100	16	..	..	..	" " " " " "	KGX, 5.10 p.m.
8	Kitchener's Horse	9	236	..	..	..	..	VE, 9 a.m. ..	C.T.
9	5 E R.G.A.	2	63	..	..	..	..	KDX, 6.20 a.m.	Ladysmith
10, 11	Remounts	..	..	187	40	..	..	NC, 12 a.m. VL, 6.40 a.m.	SNR
13	E. Lancs. Regt.	..	18	..	..	..	..	SNR, 4.30 a.m.	KGX
14	Remounts	..	..	150	..	..	..	NC, 6.45 a.m.	VL
15	Q. I. B.'s	18	275	..	..	..	..	SFN, 7.30 a.m.	Queenstown
	Norfolks	1	38	..	..	..	..	" " " " " "	
16	R. Sussex Regt.	2	106	..	..	..	..	SFN, 6.30 a.m.	Jagraft. Road
17	T. M. I...	2	124	..	..	..	..	BFX, 4.30 a.m.	Ladysmith
	Remounts	..	..	17	..	..	..	Naanwpoort..	BRS
18	Remounts	..	..	17	..	..	..	" " " " " "	EFN
	Remounts	..	..	10	..	..	..	" " " " " "	KDX



## SPECIMEN OF DAILY TROOP MOVE REPORT, &amp;c.--continued.

Tels.	Corps.	Officers.	Men.	Horses.	Mules.	Oxen.	Wagons.	Left.	Destination.
19, 24	Gen. Hamilton's column, E. Lances...	12	300	11	8	..	2	HGX, 1.55 p.m. EFN, 4.35 p.m.	KGX
21, 23a	R. Scots Fusiliers .. ..	4	100	..	..	..	..	EFN, 4 p.m...	PRS
22	E. Lances. .. ..	1	60	9	comp.	E. Lances.	..	HGX, 4.15 p.m.	KGX, 11.20 p.m.
25	3 Fld. Tp. R.E. .. ..	1	39	..	..	..	..	" "	KGX, 11.20 p.m.
26, 29	Gen. Hamilton's staff and transport	..	..	14	..	..	8	GD, 12.40 p.m. EFN, 9.10 p.m...	KGX
23	K.O.Y.L.I. .. ..	2	78	..	..	..	..	VE, 3.5 p.m.	EFN
28, 36	Gen. Hamilton's column, 5th D.G.'s	3	96	13	..	..	..	EFN, 1.15 a.m.	KGX
30, 37	" "	..	..	..	5	..	16	EFN, 3.30 a.m.	KGX
A.	Naanupoort Report .. ..	..	..	252	..	..	..	PE to BFX	..
31	Remounts .. ..	..	..	259	..	..	..	Mooi Riv., 8.30 p.m.	NC
32	R. Sussex Regt. .. ..	2	58	..	..	..	..	SFN, 4.30 p.m.	JGX
33	" .. ..	3	100	..	..	..	..	SFN, 5.20 p.m.	JGX
34	I. Y. .. ..	1	95	..	..	..	..	BFX, 8 a.m..	Worcester
35, 38	Gen. Hamilton's column, 5th D.G.'s	7	43	8	5	..	5	GD, 11.35 p.m. EFN, 6.20	KGX
41	2nd N.S.W.M.R. .. ..	..	10	63	..	..	..	Durban, 6.45 p.m. ..	KP
	1st .. ..	2	26	357	..	..	..	" 7.40 p.m. ..	VL
42	Remounts .. ..	..	1 train	..	..	..	..	VL, 5.30 a.m.	..

2 more trains to complete Gen. Hamilton's move.

NOTE.—SFN, GD, &amp;c., are Traffic Abbreviations for Stations.

**SPECIMEN OF DAILY GOODS TRAFFIC REPORT HANDED TO  
THE COMMANDER-IN-CHIEF.**

*22nd June, 1901.*

		Supplies.	Ordnance.	Troops.	Remounts.	Civil.	Various.	
		Trucks. 2 1 F.F.C.*	Trucks. 1	Trucks.	Trucks.	Trucks.	Trucks.	
Cape Town..	.. Across	2	1					
	Inside	2	14	8				
P. Elizabeth	.. Across	31						
	Inside	17	1					
East London	.. Across	37	4	..	..	9	..	2 R.E.
	Inside	9	..	..	16	..	..	1 R.E.
Durban ..	.. Across	37	..	..	.	..	..	2 A.S.C.
	Inside	5	..	..	..	..	..	1 civil Hsmith.

From Point* to Transvaal.	Pretoria	..	20 tons.
	Standerton	..	130 „
	Elandsfontn.	..	80 „
	Heidelberg	..	90 „
	Volksrust	..	20 „

Traffic to I.M.R., 22nd	..						
Via Naauwpoort	.. ..	36	3	19	23	..	19
Via Bethulie..	.. ..	15	..	..	1		

**LINE REPORTS.**

Report from Greylingstad.—Damage caused to line yesterday by engine running too fast over a culvert which had previously been damaged, and where a speed board was up. Engine re-raild at once, but culvert had to be seen to. Traffic resumed at 6 a.m. to-day.

\* NOTE.—“Point” is Durban Harbour.  
“F.F.C.” is Field Force Canteen.

## IMPERIAL MILITARY RAILWAYS.

22nd June, 1901.

		Trains.	Supplies.	Ordnance.	Troops.	Animals.		Civil.	Mails.	Railway.	Miscellaneous.	Total. Short Trucks.
						Horses.	Other.					
21st	Received ..	6 {	66 3 F.F.C.	28	9	1	..	6	5	1	{ 1 Exp... 2 Med. S. .. }	122
	Forwarded	6	30	8	5	4	..	5	2	5	{ 7 R.E... 2 Refgr. .. }	68
BLOEMFONTEIN—												
22nd	Received ..	5	68	4	10	..	..	4	..	6	{ 1 Med... 4 R.E... 1 Mines .. }	98
	Forwarded	6	34	7	..	9	..	6	2	6	{ 3 Med. 3 R.E... 1 Refgr. 1 Mines .. }	72
21st	Received ..	8 {	22 1 F.F.C.	2	..	..	16	18	..	..	{ 11 .. 2 R.E... .. }	72
	Forwarded	8 {	28 2 F.F.C.	1	..	..	13	18	..	..	{ 7 .. 2 R.E... .. }	71
VOLKSRUST—												
22nd	Received ..	9 {	34 1 F.F.C.	6	..	..	9	16	..	..	{ 1 and 9 R.E. .. 12 N.R. .. }	88
	Forwarded	8	33	5	..	..	9	14	..	..	{ 1 and 11 R.E. 12 N.R. .. }	85
Efn. coaches—												
	From N. ..	..	9	..	..	..	..	6 coal	..	..	.. .. ..	15
	„ S. ..	3	6	1	6	4	4	1	1	..	{ 15 .. 4 Bridging material }	32
	„ S.E. ..	7	10	76	2	3	22	2 { 14 16 coal }	..	..	{ 1 .. 2 Armrd. trucks }	138
JOHANNESBURG—												
	To W. ..	..	12	..	5	..	2	20 coal	..	..	16 .. ..	..
	From W. ..	..	1	1	5	..	3	..	..	..	21 .. ..	..
21st	Received ..	..	72	..	..	..	..	5	..	..	1 Unlab. ..	78
	Forwarded	..	54	..	..	..	..	9	1	..	{ 1 Hosp. bogie.. 2 Coaches .. 3 Vans .. }	70
KOMATIE POORT—												
22nd	Received ..	.. {	17 3 Hosp.	..	..	..	..	..	..	..	.. .. ..	20
	Forwarded	..	55	1	..	8	..	3	..	..	5 vans ..	72

## TROOP MOVES SINCE LAST REPORT.

Troops and horses	..	..	..	1 train	..	North	..	Midland
Troops, horses, wagons	..	..	..	„	..	West	..	„
Horses	..	..	..	„	..	P.E.	..	BFX
Four trucks, natives	..	..	..	..	..	West	..	North
Boer prisoners and escort	..	..	..	„	..	C.T.	..	BFX

NOTE.—Med., Medical. Refgr., Cold meat.

This information was absolutely necessary to the Commander-in-Chief, when, in September, 1900, the campaign changed to guerilla warfare, in the course of which the enemy moved rapidly all over the country, made attacks on the lines of communications, and also invaded the Cape Colony. The effect on the railway was, that large troop movements had constantly to be made from one portion to another of the system. The largest move from one station was perhaps that of 9,000 men, 14,500 horses and mules, 373 trucks of oxen and wagons, and 48 guns, despatched from Bloemfontein in nine days at the beginning of February, 1901, which detrained at Naauwpoort and De Aar, in order to drive back the invading force under Commandant De Wet. On this occasion a record at De Aar was established by the despatch of 25 trains and the receipt of another 25 in one day. Another large move was the railing of General French's force in 67 trains from the south-east of the Transvaal to Middelberg.

These are, however, only two among many moves, some as large, some smaller, which were made during the campaign.

With reference to the move first quoted, from Bloemfontein to De Aar, a typical case occurred of a want of understanding of railway working by staff officers. While these troops were pouring in and the railway was taxed to its utmost, it was ordered to entrain mounted troops at De Aar to proceed to Hanover Road, a distance of less than 40 miles, which naturally could have been done far more expeditiously if the troops had marched, and left the railway clear for the more important troop movements.

This railing of troops from one point to another of the railway system over great distances was naturally a great advantage to us over the enemy; but attention is once more drawn to the uselessness of railing mounted troops less than 80 miles and infantry less than 40 miles, and even then it would be better for them to march unless there is great urgency. The Commander-in-Chief, while constantly using the railway for movements of large numbers over long distances, always called for explanations from officers who ordered short troop movements by rail.

The result, however, of the large, necessary, troop movements, was that rolling stock was kept passing to and fro on the Imperial Military Railways, instead of running down to the Cape and Natal. This caused frequent complaints to be sent by the General Managers of the Cape Government Railways and Natal Government Railways, who were thus deprived of rolling stock, and, what was more serious, it prevented the transport of coal from the Transvaal collieries to the Cape Railway System, which depends for its existence on the Transvaal collieries, the Cape Government Railways having cancelled the agreement current with English collieries during the time that the Transvaal collieries were inaccessible.

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## II.—CAPE GOVERNMENT RAILWAYS.

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### (IIA.)—GENERAL DESCRIPTION.

Before proceeding further, it is necessary to give a short sketch of the Cape Government Railway System.

The Cape Government Railways are divided into four systems, Eastern, Midland, Western, and Northern.

- (1) The Eastern System extends from East London, through Stormberg to Bethulie and Aliwal North;



- (2) The Midland System from Port Elizabeth, through Rosmead to Stormberg, Naauwpoort, De Aar and Norvals Pont ;
- (3) The Western System from Cape Town to De Aar ;
- (4) The Northern System from De Aar to Vryburg, north of which the railways belong to Rhodesia. (See Map.)

There is a General Traffic Manager at Cape Town, under whom is a Traffic Manager for each of the four systems. Under the Traffic Managers are Assistant Traffic Managers, stationed at Cape Town, Beaufort West, Port Elizabeth, Naauwpoort and East London.

The total length of the systems is 1,987 miles.

### (IIb.)—MILITARY CONTROLLING STAFF.

The General Manager and Chief Traffic Manager of the Cape Government Railways thoroughly agreed with the proposals and assisted in every way the formation of the Military Controlling Staff as coadjutors of their "Technical Working Staff."

With this end in view Major V. Murray, R.E., was appointed Assistant Director of Railways for the Cape Colony. As such, he was on the Staff of the General Officer Commanding Lines of Communication, Cape Colony. He was also on the Director's Staff, and it was his business to co-operate with the General Traffic Manager of the Cape Government Railway, in whose offices he was given accommodation. In this dual capacity it was his duty to inform the General Officer Commanding and the Director, of the possibilities of the railway, to take the orders of the General Officer Commanding and advise him as to the best methods of carrying them out, and then to inform the railway officials what was required, and, as stated before, to protect them from interference by unauthorised military officers. He was responsible that proper regulations were issued to the Army for the conduct of entrainments and detrainments, forwarding of stores, and for correct accounts between the Army and the railway. He was the sole channel of communication between the General Officer Commanding and the Chief Traffic Manager.

It was his duty to so restrict the civil traffic of the systems, that Army requirements should invariably be met.

This arrangement of always conveying orders to the railway officials by the same officer caused cordial understanding to arise between the railway and the Army. Each understood the difficulties and requirements of the other, and hearty co-operation to overcome these difficulties ensued.

In order to help the Assistant Director of Railways to co-operate with the civilian railway officials on this long length of line, four officers were appointed to act as Deputy Assistant Directors, viz. :—

Captain J. M. Burn, for the Eastern System.

Captain W. V. Scudamore, for the Midland System.

Captain H. C. Nanton, for the Western and Northern Systems, with headquarters at De Aar.

Lieutenant E. H. M. Leggett, Deputy Assistant Director of Railways at Cape Town.

The duties of the Deputy Assistant Directors were similar to those of the Assistant Director of Railways, in a subordinate position. Whereas the Assistant Director was Staff Officer for railways to the General Officer Commanding Cape Colony and co-operated with the General Manager and Traffic Manager of the Railway, the Deputy Assistant Director was staff officer for railways to the General Commanding on his portion of the railway system, and co-operated with the Traffic Manager of that portion, under the orders of the Assistant Director.

The duties of a Deputy Assistant Director were :—

1. To keep the Assistant Director fully informed of the possibilities of his portion of the railway system and the requirements of the Army on it.
2. To report to the Quartermaster-General and the Director by telegram, repeating it to the Assistant Director and his own General Officer Commanding, any local moves ordered or other circumstances likely to affect the traffic and moves ordered by Army Headquarters.
3. To be the sole channel of communication between the General Commanding his portion of the railway system and the railway officials.
4. To superintend all large troop movements.
5. To see that all regulations made by the Assistant Director of Railways were enforced, especially as to preventing trucks being kept under load too long, and to protect the railway officials from military interference.
6. At the same time to see that the maximum amount of work was got out of the railway by the civil officials, and that steps were taken by them to remedy traffic mistakes and to clear any block to trains that might occur.
7. To see that the proper returns were rendered for purposes of account between the Railway Department and the Army.

Finally, below the Deputy Assistant Directors were railway staff officers at all important stations. They alone, of all the railway controlling staff, were provided for under the regulations governing the Army. These regulations make it plain that the Railway Staff Officer in carrying out his duties requires no special knowledge of railways, as he is not called upon to interfere with technical working in any way. Therefore he is to be under the orders of the Station Commandant.

The converse, in every way, has been the experience in South Africa. The more he knew of his railway, the less he interfered, and the more useful he became to the whole Army.

The Director protested that railway staff officers should be under his orders, but for the first part of the campaign the regulations were strictly adhered to. In the earlier stages of the campaign, when senior officers of the Regular Army were Commandants the difficulties were perhaps not so great as at later periods, when Commandants were changed with frequency, as also the railway staff officers. Chaos in large troop movements was only averted by the fact that the railway staff controlled Cape Town facilities, and in all large moves Deputy Assistant Directors of Railways were augmented by special officers at important points. Gradually railway staff officers saw that it was to their advantage to know more about actual railway working. With this advancing interest less friction between the Army and civil railway authorities followed, though at no time was it very severe, but the paralysis of train movements continued, and the numbers of trucks kept under load increased. Even as late as March, 1900, when Bloemfontein was ours, the want of proper instructions as to what goods the railway were to carry caused over 1,100 trucks to be loaded at De Aar, Naauwpoort, and Norvals Pont by various departments; and notwithstanding all endeavours to prevent it, a block occurred at the critical moment when the Army had to be re-clothed and re-victualled after the victorious march from the Modder River.

At Bloemfontein, when the Army annexed the Orange Free State Railways, a Military Controlling Staff was placed over the technical working staff (civil and military), and here it was agreed by the Chief of the Staff that all railway staff officers were to be under the orders of the Director of Railways through his Deputy Assistant Directors. Henceforward many difficulties recurred, but there now was an undivided chain of responsibility, and mutual confidence was engendered between the controlling and working staffs. Shortly afterwards the railway staff officers of the Cape Colony were placed under the Assistant Directors. This was practically the system of German and Austrian concentrations and working of railways, though for the



term "working" of railways, in war should be substituted "controlling and working."

The following were the general duties of railway staff officers :—

- (1) To be the sole channel of communication between the Army and Station Masters, who take military orders from no one else.
- (2) To protect Station Masters and other railway officials from interference by unauthorised officers.
- (3) To arrange all details of entrainments, detrainments, and forwarding of stores, with the Station Master, and to inform the Commandant, who communicated with the troops concerned.
- (4) To meet all troops arriving to entrain, and to inform the officer commanding, the time and place of entrainment. To allocate the different trucks to the different units. To be present at all entrainments and answer all questions that might arise.
- (5) To see that all trains were quickly loaded and not kept waiting.
- (6) To see that railway officials were prompt in furnishing trucks at the right time and place.
- (7) To see that only the authorised amount of baggage was loaded, and that no unauthorised persons proceeded to the front.
- (8) To inform Station Masters what trucks were most urgently required, and what could wait.
- (9) To give the railway officials warrants for all troops and stores despatched.
- (10) To telegraph the composition and time of departure of every train to the railway staff officers at destination of troops and stores.
- (11) To meet all troop trains and see that troops detrained with utmost despatch.
- (12) To arrange for hot water to be ready for meals of troops arriving or passing through.
- (13) To direct to the rest camp all details who were to wait before proceeding or for whom there were no definite orders.
- (14) To see that trucks were not kept under load a moment longer than necessary.
- (15) He could in no way interfere with railway employes either in shunting or marshalling of trains or in traffic management. He communicated only with the Station Master, and if mistakes were not remedied he reported to the Deputy Assistant Director of Railways, who would refer the matter to the Assistant Traffic Manager.
- (16) He was to enquire into all complaints, either on the part of the railway officials against the Army or *vice versa*, and if he could not settle them himself, to report to the Deputy Assistant Director of Railways of the district.

The above was the organisation established by the Director to ensure the smooth working of the Cape Government Railways. Briefly stated, it was to leave technical working entirely in the hands of the technical civil officials, but in order to ensure that the maximum amount of work was done by them, and also to protect them from military interference, a staff as described above was appointed.

#### *Forwarding Troops and Stores to the Front.*

This organisation was soon tested. A considerable number of troops arrived from England and were forwarded, some to Natal, a great many up the Western line, and a few to General Gatacre on the Eastern line.

The staff of Deputy Assistant Directors was found to be of great benefit to the railway officials, who appreciated their work, and laboured in hearty co-operation with them, but they found difficulty in establishing their position with the generals and staff officers, to whom this arrangement was an entire novelty, which they did not at first understand.

When the Army received a check at all points towards the middle of December, 1899, a period of inaction followed, which time, however, was of the greatest advantage to the railway departments. It enabled supplies and railway material to be forwarded to the front; it gave time for the elaboration of the new organisation, and for the formation of the Field Railway Sections and Railway Pioneer Regiment, which are referred to later.

Lords Roberts and Kitchener reached Cape Town towards the middle of January, and soon after their arrival it became evident that the railway was about to be taxed to its utmost. Large numbers of troops and great quantities of military stores were arriving daily from England. The first portion of these had been sent to the Midland area, in the neighbourhood of Naauwpoort and Rosmead, in opening the line as far as Thebus, but the strain came a few days later, when Lord Roberts made his famous change of front, by denuding the Midland area of almost all its troops and railing them round to detrain between the Orange and Modder Rivers, while at the same time a large number of reinforcements poured up the line from Cape Town and Port Elizabeth.

The absolute necessity of preserving the strictest secrecy added greatly to the difficulty of carrying out these moves, as information could not be sent except at the last moment to the people concerned, and, even then, as little as possible was told them. Each unit was designated by a letter of the alphabet in all telegrams, the key being supplied to officers in authority.

The Works Departments of both the Midland and Western Field Railway Sections were busily employed laying in sidings at Orange River, Graspan, Enslin, Honey Nest Kloof, and Modder River. The total length of these sidings was not less than 10 miles.

The Assistant Director, Midland Field Railway Section, was ordered to superintend the entrainment of General French's forces at Rensburg Siding. The Royal Engineer officers of both field sections were told off for railway staff officers' work at Rensburg, Naauwpoort, Orange River, Graspan, Enslin, Honey Nest Kloof, and Modder River. Major V. Murray, Royal Engineers, having worked out the details of the move with the General Traffic Manager at Cape Town, proceeded to Naauwpoort, De Aar, and Orange River with the Traffic Manager of the Midland system, and instructed the officers on the Director's staff as to what was to be carried out, at the same time giving his assistance and advice to the Midland and Western Traffic Managers. Captain Nanton, Royal Engineers, Deputy Assistant Director, superintended the railway staff officers at the various detraining stations, and assisted the Cape Government traffic officials.

Approximately the total number of troops detrained between Orange River and Modder River between January 26th, and February 12th, 1900, was 30,000, with horses, mules, oxen, guns, and transport. This was the largest troop move carried out by the railways during the campaign, and the greatest credit is due to the Cape Government Railways for the manner in which it was worked.

The comparatively smooth working between the Army and the Cape Government Railways, which was thus established at the commencement of the campaign, continued throughout; the value of the railway was therefore greatly enhanced, as shown by the following figures.

The military traffic carried on the Cape Government Railways between October 1st, 1899, and March 31st, 1901, was :—

Goods	...	...	...	...	1,057,795 tons ;
Passengers	...	...	...	...	1,247,060 ;
Horses and other Live Stock	...	...	...	...	540,321 ;

besides many wagons and guns.

## (IIc.)—RE-CONSTRUCTION OF THE CAPE GOVERNMENT RAILWAYS.

### FIELD RAILWAY SECTIONS AND RAILWAY PIONEER REGIMENT.

Having thus organised the control of the Cape Government Railways the next point to be considered was the repair and working of the lines damaged by the enemy, and taken over from them as we advanced. It was decided, very rightly, as was afterwards proved, that all portions of the Cape Government Railways which we should re-capture should be, as soon as possible, worked by the traffic staff of the Cape Government Railways in the same way as the portion already in our hands. The railways in the enemy's country, however, were to be entirely taken over by the Director, and worked by his staff, as will be described later.

The question of repair to damaged lines was quite another matter. At this time, viz., at the end of October 1899, the enemy were in possession of the line between Mafeking and Orange River, also from Molteno through Stormberg to Bethulie and Aliwal North, and westwards nearly to Rosmead. They also held the line from Norvals Pont to Arundel, and were threatening Naauwpoort, which place they very nearly succeeded in capturing. Fortunately this did not occur, for Naauwpoort, being a large central junction connecting the Western, Midland, and Eastern Systems, was a place of paramount importance, the loss of which would have been severely felt by the railway and the Army.

As regards the repairing of damaged lines, the Director determined to keep this in his own hands and not to leave it to the Engineering Department of the Cape Government Railways. He decided, and subsequent events in Natal and elsewhere fully proved the correctness of his views, that the Civil Engineering Department, though no doubt equally skilled at large engineering works, could not carry out hasty or even permanent repairs under war conditions as speedily as could be done by the Royal Engineers, together with a special local corps of artizans, viz., the Railway Pioneer Regiment (1,000 strong), for the following reasons:—

A Civil Engineering Department is absolutely bound to consider expense. They require covering authority for all expenditure before they undertake it, and their natural inclination, from very long training, is to do the work in the cheapest possible manner, without greatly considering time.

They do not appreciate the extraordinary value of days, and even hours, in war time.

They have not the same power over their men, and, although the civilians of the Railway Engineering Departments in South Africa showed the most extraordinary loyalty and self-sacrificing willingness to work long hours, yet they do not always understand cutting down their baggage and looking after their own cooking and feeding arrangements as well as working, and the absolute importance of even a few hours. When the urgency of the case is fully explained to them, they are quite willing to make great efforts; but in war there is not always time to explain the why and the wherefore of everything, and therefore the Royal Engineers, whose officers and men are governed by discipline and cannot ask reasons for orders or grumble at discomforts, have great advantages over Civil Engineering Departments, knowing as they do that a day saved in the duration of the war is of supreme importance to both operations and expenses.

Repairs to the railway at the front are frequently carried out under fire, or at any rate in the presence of the enemy, and, though civil workmen are frequently as indifferent to danger as anyone else, yet no one has power to force them to continue work under such conditions, and at any moment a refusal might be made, to the great detriment of the Army's operations.

Civil Engineers are not accustomed to dealing with staff officers and the other branches of the Army. They are bewildered by the various titles, and do not know which officer to approach when they require arrangements made; consequently the arrangements are not made, and then they are inclined to complain of red tape and obstruction.

It must not be thought from this that the great efforts of the Civil Engineers and artisans are not appreciated, but each has his own sphere, and full proof of this is furnished by the tables in Appendix C, giving details of the work done in repairing the line and the time taken in each case. These show that the foregoing remarks are fully justified, and should be borne in mind in a future campaign.

Under these circumstances the Director arranged with the Chief Engineer of the Cape Government Railways that all temporary repairs to his lines should be entirely in the hands of the Director, but that the Cape Government Railways would undertake any temporary repairs which the Director of Railways might ask them to do, and also carry out all permanent repairs on their lines.

It was evident that the first main advance of the Army would be along the line from Orange River to Kimberley, and from Naauwpoort to Norvals Pont. For the repair of these two lines the Director organised two field railway sections, the Western, with headquarters first at Orange River, to be under Major W. R. Stewart, R.E., Commanding the 8th Company, Royal Engineers, and the Midland under Captain (local Major) J. H. Twiss, R.E., with headquarters at Naauwpoort.

These two officers were appointed Assistant Directors, Western and Midland Railway Field Sections respectively. They were to have absolutely no jurisdiction over the "Lines of Communication" railways, which, as stated before, were under the Assistant Director, Cape Colony, but were responsible for the working of the railways taken over from the enemy, sections of which they were to hand back, repaired, to the Assistant Director, lines of communication, as the advance proceeded.

The 8th Company Royal Engineers had been in South Africa for several weeks and prior to the outbreak of hostilities the men had been dispersed over the Cape Government Railways and had become acquainted with the system of working. The organisation of the field railway sections was as follows:—

- (i) Western Field Section, Major W. R. Stewart, R.E., Assistant Director.  
 Staff Officer to the Assistant Director, Lieut. H. O. Mance, R.E.  
 Superintendent of Works, Captain W. D. Waghorn, R.E.  
 Traffic Officer, Lieut. A. M. Henniker, R.E.  
 Railway Troops, 31st Company Royal Engineers, commanded by Captain F. Fuller, R.E.; and  
 8th Company Royal Engineers, commanded by Lieut. G. Frith, R.E.
- (ii) Midland Field Section, Captain (local Major) J. H. Twiss, R.E., Assistant Director.  
 Staff Officer to the Assistant Director, Lieut. H. L. Pritchard, D.S.O., R.E.  
 Traffic Officer, Lieut. C. E. Vickers, R.E.  
 Railway Troops, 10th Company Royal Engineers, commanded by Lieut. L. B. Millington, R.E.  
 20th Fortress Company Royal Engineers, commanded by Captain C. Wilson, R.E.; and  
 42nd Fortress Company Royal Engineers, commanded by Lieut. A. G. T. Cusins, R.E.

About 400 Orange Free State Railway employés of every grade and trade had left the Free State and placed themselves under the Director. A great number were drafted into employment on the Cape Government Railways, and the remaining 150 were placed at the disposal of the field sections. Each field section was also augmented by 300 natives. This number fluctuated from time to time, according to the amount of work in progress.

The duties of an Assistant Director, Field Section, were :—

1. To keep himself in constant touch with the General commanding the advance. To ascertain his requirements and inform him as to what the railway could or could not do, and to make all necessary arrangements.
2. To carry out temporary repairs as rapidly as possible.
3. To establish traffic staff in all railway stations captured, and to control the traffic working between the railhead and a station behind, which was to be known as the "Junction station."

This Junction station was to be the dividing line between the authority of the Assistant Director of Railways, Communications, and the Assistant Director of Railways, Field Section—*i.e.*, between civil and military working. After much discussion, it was decided that the junction station should be under the Assistant Director, Communications, who would, however, consult all wishes of the traffic officer of the field section.

As the Army advanced, the repaired line would be handed over in sections of approximately 50 miles to the Assistant Director, Communications, and the junction station moved forward.

When it is said that the line was handed over to the Assistant Director, Communications, it is meant that it was under his control, but of course worked as previously described by the Cape Government Railways.

These were the Director's regulations at this period, but, while the lines of communication organisation was found to be absolutely correct, and gave good working results, the traffic regulations of the field sections were found to be impracticable, and the field sections later on ceased to exist as such, and became construction parties, carrying out repairs only, with no control of traffic except at railhead. The reasons for this will be fully stated when we come to the time when the field sections were abolished.

#### RAILWAY STORE DEPARTMENT.

In order to keep the repairing parties fully supplied with material, it was necessary to organise a Stores department. For this purpose, immediately on landing at Cape Town, the Director made careful enquiries as to the stocks of timber, rails, sleepers, and small stores procurable locally. It was found that nearly 300 miles of permanent way material ordered for the Rhodesian Railways, which were now cut off by the action of the enemy, and also for other new lines, could be drawn on at short notice. Timber was plentiful in Cape town, Port Elizabeth and Durban, and a considerable quantity of small tools and stores could be obtained. The Cape Government Railways made no difficulty about concluding arrangements by which all railway stores could be purchased through them on the contracts already concluded by them. This was a most advantageous arrangement, and saved the Government a considerable sum.

Quartermaster and Hon. Lieut. A. N. Tucker was placed in charge of the Director's Stores Department, which he at once proceeded to organise.

It was decided to establish advance depôts of railway material, first at the Orange River, and later at Naauwpoort.

The absolute necessity of having an advance depôt within at least fifty miles of railhead, prior to an advance, has been conclusively proved by experience. During the whole time that the railhead construction parties were advancing they were steadily and promptly supplied with practically everything they required, a most important factor in their success.

On the 21st November, 1899, Lord Methuen advanced from Orange River in the hope of relieving Kimberley, and the Western Field Section under Major Stewart immediately commenced its work repairing the line and following up the Army. The repairs as far as Modder River were not heavy, and the construction train was able to keep pace with the troops.

On December 11th, 1899, the Director returned to Cape Town from Natal, and found that the Midland Field Section under Major J. H. Twiss, R.E., had left for Naauwpoort on the 27th November, where it was waiting

in readiness to follow up the advance. The Western Field Section having advanced to Modder River and opened railway communication with that place, was halted there owing to the check at Magersfontein.

In consequence of Lord Roberts' move from Modder River, the enemy abandoned the line between that place and Kimberley, and, on the 16th February, repairs to this portion were begun, the Western Field Section working by day, and the Midland Field Section, which had been ordered round to assist, by night.

At Spytfontein, on the 19th February, 1900, they met the construction party working south from Kimberley, and the line to that place was open. The Western Field Section then remained at Kimberley, while the Midland Section was sent back to Naauwpoort, to be held in readiness for the advance through the Free State.

In the meantime, on the 21st February, 1900, the Director, with his Staff Officer, Captain H. G. J. de Lotbiniere, and accompanied by Major V. Murray, R.E., Lieutenants A. G. Stevenson and E. O. Newcombe, and Mr. Hoy, Traffic Manager, Midland System, C.G.R., rode to Lord Roberts' headquarters near Paardeberg, having given orders that one wing of the Railway Pioneer Regiment under Major G. A. Goodwin, together with all the refugee Orange Free State Railway employes who had been collected at Modder River were to follow as fast as possible, to overtake Lord Roberts' Army. The idea was that the Director should accompany Lord Roberts to Bloemfontein, seize the railway, and immediately commence organising and making the necessary repairs southwards to meet the Midland Field Section working northwards. When, however, the Director arrived within one day's march of Paardeberg, he received instructions from the Chief of Staff directing all railway men to proceed to Naauwpoort and work up to Bloemfontein from that place. Accordingly, all previous orders were countermanded, and the whole of the Railway Pioneer Regiment and the Orange Free State Refugee Railway employes were ordered to Naauwpoort.

On February 26th, 1900, General Clements commenced to advance northwards from Arundel, through Colesberg towards Norvals Pont, following up the retreating enemy.

On March 7th, 1900, General Gatacre commenced to advance northwards from Molteno through Stormberg towards Bethulie, and the repair of the railways, following up these two advances immediately began.

One wing of the Railway Pioneer Regiment under Lieut.-Col. J. E. Capper was ordered to repair the line between Rosmead and Stormberg. The Midland Field Railway Section commenced to repair the line between Arundel and Norvals Pont. On arrival at the Orange River it was found that both the Bethulie and Norvals Pont bridges had been destroyed.

The Eastern line being of less importance than the Western and Midland, the Director arranged with the Chief Engineer, Cape Government Railways, for the repairs from Molteno to Bethulie and Aliwal North to be carried out by them, in order that the Director might concentrate the whole of his working parties at Norvals Pont, which was, of course, the most important point, and would probably require the presence of very strong repairing gangs to ensure rapid progress. Unfortunately the arrangement with the Cape Government Railways broke down. This was one clear instance of the remarks already made with reference to the rapid repairs by Civil Engineering Departments.

Major Graham Thomson, R.E., commanding 12th Field Company, Royal Engineers, finding that the District Engineer of the Cape Government Railways had not sufficient men at his disposal, and was altogether unprepared for the work, after consulting with Captain J. M. Burn, R.E., Deputy Assistant Director, took over the repairs of the line from Stormberg to Bethulie and Aliwal North, and succeeded in keeping pace with General Gatacre's advance to Orange River.

The Midland Field Railway Section, having repaired the line as fast as General Clements advanced up to the Orange River, took charge of the construction of a deviation and low-level bridge at Norvals Pont, while the Railway Pioneer Regiment, which was now concentrated at this point in full strength, immediately commenced permanent repairs of this big bridge.

As a first measure, an aerial tram was put up by the Railway Pioneer Regiment. This started working on the 25th March, 1900, and carried over 20 tons the same day, 60 tons the next, and 85 tons on the 27th.

Lord Roberts had arrived at Bloemfontein on the 13th of March, 1900. He fortunately succeeded in capturing 28 engines (some out of repair), and 325 trucks, while the line southwards to Norvals Pont and Bethulie was undamaged.

On March 27th, 1900, 11 days after the arrival of General Clements at Norvals Pont, and 13 days after the arrival of Lord Roberts in Bloemfontein, traffic was opened over the low-level Norvals Pont bridge by the Midland Field Railway Section, and a train ran through to Bloemfontein. Half of the Railway Pioneer Regiment remained at Norvals Pont carrying out the permanent repairs to the high-level bridge, and the other half proceeded to Bethulie to relieve Major Graham Thomson of the work there.

The Midland Field Section proceeded on 11th April, 1900, to Bloemfontein, where they put in sidings, and prepared for the next advance northwards.

At Bethulie General Gatacre's advance scouts under Major Neylan had succeeded in saving the road bridge from destruction, though the railway bridge had been very badly damaged. Major Graham Thomson, R.E., had laid a railway diversion over the road bridge, which, although not capable of taking engines, was fit for loaded trucks, which were hand shunted across and taken away by engines on the opposite side.

In this manner railway communication with Bloemfontein, *via* Bethulie, was opened on March 27th, 1900, but, as it was necessary to have through communication with locomotives as well as trucks, Major G. A. Goodwin was sent from Norvals Pont with half a battalion of the Railway Pioneer Regiment, and immediately commenced a deviation and low-level railway bridge.

## (II.)—THE RAILWAY PIONEER REGIMENT.

In December, 1900, the Director decided that he had not sufficient officers and men at his disposal to carry out the extensive repairs that would probably be necessary on the advance, both through the Free State and towards Mafeking. It would not be possible to obtain any more companies of the Royal Engineers, and while this matter was under consideration a letter was received from the High Commissioner, Sir Alfred Milner, stating that he was desirous of obtaining employment for a large number of Johannesburg miners and artisans out of work in Cape Town, and that he had been requested by Mr. L. I. Seymour, Consulting Engineer, Rand Mines, and Mr. G. A. Goodwin, both leading mining engineers from Johannesburg, to obtain permission to enrol a corps of miners and artisans for use on the railways and elsewhere. After some discussion and a few interviews the Director decided that a corps of this sort would be of great use for semi-permanent and permanent repairs, following up behind the temporary repairs made by the Royal Engineers, and especially in the reconstruction of the important bridges over the Orange River at Norvals Pont and Bethulie, which were almost certain to be destroyed by the enemy. Mr. L. I. Seymour and Mr. G. A. Goodwin were appointed Majors in the regiment which was about to be raised, and these officers set about recruiting for it. Lieut.-Colonel J. E. Capper, R.E., who had arrived a short time before from England, was given the command of the regiment, hereafter called the Railway Pioneer Regiment (R.P.R.), whilst Captain E. D. Swinton, R.E., was appointed Adjutant. Captain J. F. Fisher, R.A., and Lieutenant Homan, R.A., although not Engineers, were appointed to assist in the military organisation of the regiment. Lieutenant S. H. Wilson, R.E., was also told off as a company officer, and Hon. Lieutenant G. Taylor, R.E., as Quartermaster. Several non-commissioned officers and men were taken from the 20th Company, Royal Engineers, and posted to companies in the Railway Pioneer Regiment, to assist in its formation.

Owing to the zeal and personal influence of Major L. I. Seymour and Major G. A. Goodwin, and other officers of the regiment, a large number of recruits were obtained, who soon formed, under Lieut.-Colonel Capper and Captain Swinton, a properly-organised engineering battalion.

### III.—NATAL GOVERNMENT RAILWAYS.

#### (III.A.)—GENERAL DESCRIPTION.

The Natal Government Railways have a total mileage of 477 miles, comprising :—

	Miles.
Main Line, from Durban to the important junction at Ladysmith ... ..	189 $\frac{3}{4}$
From Ladysmith to Glencoe ... ..	47 $\frac{1}{4}$
From Glencoe to the Transvaal Border ... ..	70
Total, from Durban to Border ... ..	307
From Ladysmith to Harrismith ... ..	60 $\frac{1}{4}$

The main line from Durban to the Transvaal Border, and the branch line from Ladysmith to Harrismith were the main lines of communication for the forces operating on this side, but two other branch lines also came in useful on a few occasions. When Botha threatened re-invasion of Natal, the branch line from the junction at Glencoe to railhead, beyond Dundee, a distance of ten miles, and the coast line from Durban northwards, a distance of 70 miles, were used to convey a large number of troops to protect the Natal frontier.

The branch line from Durban to Umzinto, a distance of 30 miles, was never used by the Army.

Heavy gradients up to one in thirty occur frequently, so that through loads are not great. The climb into the Transvaal, and also the ascent into the Free State, both necessitate reversing stations.

The traffic of the Natal Government Railways is controlled almost entirely from the head office in Durban. District Superintendents are appointed at Maritzburg, Ladysmith, and Newcastle, to supervise generally the traffic of the daily train arrangements, which latter are regulated by the station masters at Harrismith, Charlestown, Newcastle, Ladysmith, Maritzburg, Durban, and the Point (Durban).

Durban is the general dépôt for wagons and carriages, and the head office arranges, in conjunction with the above-mentioned station masters, for the proper distribution of the rolling stock, so as to meet requirements.

At the commencement of the war the line was worked on the staff and ticket system, but during the war, the electric train staff, which had been in use on a portion of the line near the coast, was gradually extended throughout the system.

#### (III.B.)—MILITARY CONTROLLING STAFF.

On the 9th November, 1899, Major G. McD. Elliott, R.E., was ordered to proceed to Natal to act as Assistant Director of Railways, with instructions



to report as to the advisability of making the same arrangements in Natal for the control of the "Lines of Communication" railways.

On the 23rd November, 1899, the Director left Cape Town for Natal with the Commander-in-Chief, Sir Redvers Buller. On arrival at Durban, he found that the General Manager of the Natal Government Railways was not prepared to acquiesce in his views in the same way that the chief officials of the Cape Government Railways had done. The General Manager, Natal Government Railways, did not anticipate any difficulty in dealing with the military traffic. The Director endeavoured to press his view of the matter, but the Commander-in-Chief, Sir Redvers Buller, decided that matters should be arranged in accordance with the General Manager's views. Time was very limited, and a large amount of urgent work called for the Director's presence in Cape Town. The length of line in Natal was very short, at that time only 160 miles were in our possession, and the whole length of main line in Natal at any time is only 370 miles. A surplus amount of rolling stock existed in Natal owing to communication with the north being cut off. The number of troops employed there was bound to be small in comparison with the number employed in the remainder of South Africa, and therefore the supply of the Natal force at the end of a short line of railway would be a matter of minor importance and present lesser difficulties. For these reasons the Director decided not to spend any more time in Natal trying to gain his point, and he therefore drew up a working agreement with the Natal Government Railways. It was therein stipulated that Major Elliott, R.E., was to act as Assistant Director of Railways in Natal, to pass all accounts between the Army and the railways, and to convey to the General Manager the wishes of the General Officer Commanding regarding the requirements of the forces.

It thus came about that the system of railway administration in Natal differed from that in Cape Colony. It was some time before the position of the Assistant Director was quite satisfactorily established. The railway staff officers also were entirely under the General Officer Commanding Lines of Communication until 1901, when they were placed under the Assistant Director, and a uniform system was adopted throughout South Africa, a system which had successfully stood the test of eighteen months' war.

The Natal Railway was of course a most important and valuable auxiliary line of communications. It fed General Buller's Army with the greatest ease, and when the Transvaal was annexed it became one of the main sources of supply to the whole Army.

The military traffic carried on the Natal Government Railways between 1st November, 1899, and 31st March, 1901, was :—

Goods	...	...	...	...	...	533,432 tons.
Passengers	...	...	...	...	...	384,045
Horses and Live Stock	...	...	...	...	...	208,273

### (IIIc.)—RECONSTRUCTION OF THE NATAL GOVERNMENT RAILWAYS.

The Director proposed to the General Manager an arrangement similar to that which he had made with the Cape Government Railways, viz. : that the temporary repairs of the Natal Government Railways should be carried out by the Director's officers and men, while permanent repairs should be carried out by the Natal Government Railways. The General Manager objected to these proposals, and stated he wished the temporary as well as the permanent repairs to be carried out by his own staff. Since the length of line in Natal was not great, and as at the time of the discussion the 6th and 20th Companies, Royal Engineers, detailed for railway work, had not yet arrived in the country, the Director decided not to press his views, and the repairs

were left in the hands of the Natal Government Railways, but Major Elliott, Royal Engineers, subsequently rendered considerable assistance by arranging for Royal Engineer Companies and large Infantry working parties to carry out a great deal of the temporary repairs for the Natal Government Railways, proving that it would have been better to have left the matter in the Director's hands, and to have allowed him to organise repairing parties similar to those in Cape Colony. Fortunately the advance of the Army in Natal was very much slower than the advance in the west, and there was ample time for the reconstruction to be carried out.

On the 28th February, 1900, Ladysmith was relieved. The repair to the Natal line had commenced previously on the 24th.

The following damage to the Natal Government Railways was repaired by the Engineering Staff of that railway, assisted in many cases by Field Companies, Royal Engineers, and Infantry working parties:—

2—	50 metre spans.
2—	30 do.
1—	20 do.
2—	15 do.
14—	100' spans.
6—	60' do.
8—	40' do.
9—	30' do.
6—	25' do.
11—	20' do.
45	spans less than 15'

Also 150 yards of damaged tunnel were repaired and numerous small breaks to permanent way were put right.

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#### IV.—THE IMPERIAL MILITARY RAILWAYS.

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##### (IVa.)—IMPERIAL MILITARY RAILWAYS IN ORANGE RIVER COLONY.

###### (1) CREATION OF IMPERIAL MILITARY RAILWAYS.

On arrival at Bloemfontein a new problem in railway organisation was presented. Hitherto we had been working on a railway system, the staff of which were loyal and full of enthusiasm for the cause. It has been shown how arrangements were made by the Director to leave the working of the Cape Government Railways absolutely in the hands of the Civil Staff, and to do all in his power to assist them and protect them from interference, but now we had entered the enemy's country, captured 149 miles of railway from them, and would be shortly in possession of several hundred miles more. The railway officials and employés in the Orange Free State were, some of them,

loyal British subjects, and others, either openly, or what was worse, secretly hostile to us, and when we should arrive in the Transvaal we should find none of the railway employées friendly to us. Consequently the Director decided to adopt an entirely different system in the Orange Free State (and Transvaal, when we should reach it), to that at work in the Cape Colony and Natal. In fact he took complete charge of these railways, and worked them under the title of the Imperial Military Railways, by a staff and employées, civil and military, appointed by him.

## (2) MILITARY CONTROLLING STAFF.

In organising the new railway system the Director kept in view the cardinal point that there should be a *Military Controlling Staff* and a *Technical Working Staff*.

It was of course quite as necessary to have a Military Controlling Staff for the Imperial Military Railways, as it had been for those in the Cape Colony, working as intermediaries between the Army and the technical working staff. Accordingly, Major V. Murray, R.E., was ordered to Bloemfontein, and was appointed Assistant Director, having first handed over his post in Cape Colony to Col. C. H. Cowie, R.E.; Captain W. S. Nathan, R.E., was appointed Deputy Assistant Director, under Major Murray, at Bloemfontein, and later on a Deputy Assistant Director was appointed at Kroonstad. During the advance, Lieut. E. H. M. Leggett, R.E., accompanied Headquarters as Deputy Assistant Director of Railways, and collected all information on railway matters that could be of any use to those behind, interrogated all railway employées found at their posts, and temporarily reappointed those men whom he considered trustworthy, sending down those whom he suspected, and making such arrangements as could be made in advance to prepare for resuming traffic as the line was repaired.

Railway Staff Officers were also appointed where necessary, and when the advance from Bloemfontein began, one was stationed at railhead to deal with troops and details moving to and from the front.

The following extracts clearly describe the state of affairs which confronted the Controlling Staff when Bloemfontein was first occupied and the Imperial Military Railways were in course of creation :—

### *Extract from Major Murray's Report.—The Halt at Bloemfontein.*

“The halt at Bloemfontein forms the second phase in the course of the railway operations. The period of this halt was spent in organising the line which had so far fallen into our hands, to enable it to carry the great traffic which was pouring in from the south. This station was about to become, on the re-establishment of through communication, the most important military railway centre. An Army of about 35,000 men was already present. This Army required food, and a complete supply of clothing equipment and horses, before it could advance. Reserves of all kind must also be accumulated to supply the columns on their march to the Transvaal. Reinforcements were also continually pouring in, and by the time the advance was likely to take place, Bloemfontein might be expected to be the only base for some considerable time for an Army of nearly 100,000 men.”

As regards the capacity of Bloemfontein Station itself, it was necessary to carefully consider its capabilities for dealing with the enormous traffic which was to be expected. Considerable siding accommodation already existed, but not in a convenient site. New sidings were therefore built to serve the large Supply and Ordnance Depôts which were to be established, and good platform accommodation was also provided for dealing with guns, animals, and carts.

For the Supply Depôt, sidings, capable of dealing with 200 trucks at one time were laid down, and for the Ordnance Depôt, sufficient for about

80 trucks, these sidings being apart from any marshalling or storing sidings already in existence. Similarly, at Springfontein, the junction of the two lines from the south, considerable additions were made in the way of sidings and platforms.

While these preparations were going on, the incident at Reddersberg and other threatened attacks necessitated the carrying out of considerable troop movements to the south, to ensure proper protection to the line. The rapidity of the advance on Bloemfontein had saved the railway between that place and Orange River from any damage, and no reconstruction works were necessary, but there were several important bridges on this section, and these had to be carefully guarded by our troops.

Fourteen miles north of Bloemfontein, at Glen Station, the railway crossed the Modder River by a bridge of considerable size. This bridge was unfortunately destroyed by the enemy on the night of 18th March, a few hours before our troops arrived to occupy the station. This necessitated the construction of a long and difficult deviation and bridge, which were commenced at once, and opened to traffic on 7th April, thereby giving access to Karree Siding, 22 miles north of Bloemfontein. This place was the headquarters of our outposts to the north, and remained the furthest limit up to which trains were worked till the advance took place. The permanent repairs of this bridge were taken in hand.

Fortunately a certain amount of stock had been captured on our occupation of Bloemfontein. The total amounted to 26 engines, 342 trucks, and 22 passenger vehicles, but of the engines only some thirteen were in working order. This stock was practically equivalent to the loss incurred by the Cape lines at the commencement of the war, and its capture enabled a train service to be at once established with the Orange River, pending the restoration of through communication.

There was through communication across the Orange River on the night of the 27th March, and prior to this date a great accumulation of loaded trucks had taken place at various stations south of the river. These trucks were now poured north into Bloemfontein. The limited number of engines available made it, however, again necessary to call upon the Cape for assistance in this respect, and the Cape Government Railways consequently handed over to the Imperial Military Railways some thirteen engines. Even with this addition, in order to cope successfully with the traffic which was pouring north, it became necessary to double-man all engines, so that they could be worked night and day, and temporarily improvised cabooses were permanently run behind each engine, in which both crews lived and slept.

The working of the railway during this period was considerably hampered by the result of the action at Sannah's Post on April 1st, when the waterworks fell into the hands of the enemy. The entire railway water supply at Bloemfontein was drawn from that of the town, and from that date was completely cut off. It consequently became necessary to run water trains from the Modder River at Glen, twelve miles north, and from Kaffir River, twenty-three miles south, until Sannah's Post again came into our possession. On our re-occupation of the waterworks, the water supply of the railway from this source was re-established on the 27th April.

Apart from the incidents above recorded, there is not much else to note in regard to this period. A steady traffic from the south was maintained, and the extent of this traffic may be gathered from the fact that some 8,600 loaded vehicles passed northwards at both Bethulie and Norvals Pont up to April 30th. Of this number, 2,093 vehicles were shunted by hand over the Bethulie road bridge, which was in use up to that date.

Some difficulty was experienced at times at Bloemfontein in dealing with the large volume of traffic, owing to the necessity for the prompt release of trucks not being fully realised, but this was overcome.

It was at this time that the necessity for regulating the military goods traffic became apparent. The question of supplies was of the utmost importance, and to ensure the safety of the Army it was necessary for everything else to give way to this traffic. Accordingly Springfontein, the junction of the two lines from the south, was made the limit beyond which nothing but supplies, a

limited amount of ordnance stores, and ambulance trains, were allowed to go. At this station all remounts, as a rule, were off-loaded, and marched thence to Bloemfontein, and it was not until towards the end of the month that such traffic as regimental baggage, &c., was allowed to come beyond this junction. By the end of April, though, a very large reserve of supplies and material had been accumulated, and, in anticipation of the advance, a considerable dépôt had also been formed at Karree. At this period it may be of interest to note that from Bloemfontein alone 65,000 men and 33,000 animals were being fed.

In the meantime railway preparations for the advance were also proceeded with. Staff were collected, materials and construction trains were got together, and every preparation made, so far as could be foreseen, for work which it was anticipated would be very heavy. By the end of the month of April sufficient reserves had been accumulated, and everything was ready for an immediate advance northward.

### (3) ORGANISATION OF TECHNICAL WORKING STAFF.

On arrival at Bloemfontein, it was found that Mr. Brounger, the General Manager, Mr. Musson, the Traffic Manager, Mr. Hawthorne, the Chief Accountant, and a very few minor employés, had gone north with the enemy; but the Chief Engineer, Locomotive Superintendent, Controller of Railway Telegraphs, and practically all the rest of the staff were at their posts on the line. All the British employés who had left the Free State were immediately brought in and reinstated, as far as possible, at their former posts. The Chief Engineer and the Locomotive Superintendent of the line were suspended. The former handed over his office to Captain W. D. Waghorn, R.E., who was now appointed Superintendent of Works, Imperial Military Railways, and the Locomotive Superintendent was replaced by Lieutenant A. G. Stevenson, R.E. Lieutenant M. G. Manifold, R.E., was appointed Superintendent of Railway Telegraphs, with the Orange Free State Controller as his assistant. The vacant Traffic Office was given to Mr. Hoy, hitherto Traffic Manager on the Midland System of the Cape Government Railways. Mr. Carolin, who had done great service in persuading British railway employés to leave the Free State and in taking charge of them during their sojourn in the Cape Colony, was reinstated as Assistant Locomotive Superintendent at Bloemfontein. The heads of departments thus appointed at once proceeded to organise with a view to meeting present and future needs in the Boer States.

Undoubtedly the best course to pursue was that traffic in all its higher grades should be in the hands of a staff fully versed in South African single-line working. The Chief Traffic Manager of the Cape Government Railways, although his own staff was by no means excessive, gave the utmost assistance by handing over to the Imperial Military Railways all the traffic officials and employés that he could possibly spare. Great assistance was also rendered in the same way by Mr. Beatty, the Locomotive Superintendent of the Cape Government Railways.

Quartermaster and Hon. Lieutenant A. N. Tucker, R.E., having appointed a representative to carry on his work in the Cape Colony, moved to Bloemfontein, and took over the administration of the Stores Department.

Some stock was available in Bloemfontein; the subordinate staff of the Orange Free State Stores Department were reappointed, and the department continued on the same lines as before.

It was necessary to move up a large amount of material so as to be in readiness for the advance, and with the congested state of the railway this was no easy matter; but fortunately everything required arrived, and during the advance the railway construction parties were kept well supplied with all they required—an important factor in their success.

Mr. C. W. Elkington, who had been Assistant Accountant in Bloemfontein

before the war, was appointed Chief Accountant, and continued to carry on the department on the lines hitherto in force.

Summarising the organisation of the Imperial Military Railways technical working staff, we find that the Director of Railways kept the entire management and control in his own hands. The Works, Locomotive, and Stores Departments were controlled by Royal Engineer officers, and the Traffic and Accounts Departments were managed by civilian railway officials with previous experience of the South African railway systems.

The Director of Railways being fully occupied in the north, Major R. S. MacLagan, R.E., was appointed Deputy Director of Railways, Cape Town, to carry on the Director's work there.

On the 3rd May, 1900, the Army commenced to advance through the Free State into the Transvaal, and all departments of the railway were called upon to make great efforts. The enemy had destroyed the railway in a manner probably unprecedented in any campaign. The Works Department had to make good this damage as speedily as possible. The Locomotive Department, being very short of rolling stock owing to the enemy's action, had to make their locomotives and staff do the maximum possible amount of work. At the same time the engine runs were entirely upset by the destruction of water pumps and tanks, and by the scarcity of coal. The Traffic Department found most of the stations deserted by the staff, and it was their task to provide the latter, and to re-open and put in order the stations at very short notice, while the small amount of rolling stock at their disposal was being clamoured for by all branches of the Army, and the impossibility of running traffic in a regular manner under all these drawbacks added enormously to the work of all the officials. The telegraph lines were destroyed extensively, while instruments and batteries were removed or broken at many stations.

Further reference to this subject will be found at pages 47-67 of this report.

#### (IVB.)—TRANSVAAL AND ORANGE RIVER COLONY COMBINED.

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##### (1) INCORPORATION OF THE TRANSVAAL IN THE IMPERIAL MILITARY RAILWAYS.

On the 1st June, 1900, the Director of Railways and Lieutenant E. H. M. Leggett arrived at Johannesburg and immediately set to work to take over the entire administration of that portion of the Transvaal Railways, which had fallen into our hands, and to prepare to assume control of the whole system which would shortly be captured by the Army. The Netherlands Railway officials, who were hostile to us, refused to work the line, and this obliged us promptly to deport every railway official of the Zuid Afrikaansche Spoorweg Matschappij. It was now necessary to incorporate the Transvaal Railways into the same Imperial Military Railways system, which had been found in the Orange Free State, and the same principles were adopted.

The headquarters of both the Military Controlling Staff and the Technical Working Staff moved to Johannesburg, leaving representatives in the Orange River Colony, and making fresh appointments to augment their staff for the purpose of taking over the Transvaal Railways.

The Transvaal Railways were not all taken over at once. While the Army halted at Johannesburg and Pretoria, and the working parties in the Orange River Colony were working night and day to open communication, the railway staff in the Transvaal made preparations to work those portions of the Transvaal Railways which had fallen into our hands.

Traffic re-commenced on the 10th June, 1900, fourteen days after our

entry into Johannesburg. Of course the working at first was by no means smooth, but the errors in the first distribution of employées were gradually corrected, and the railway working improved daily.

The first most urgent extension was made down the South Eastern line in order to open up connection with Natal. The construction train from the Western line having reached Mafeking, was ordered round to work, to meet the Natal working parties coming from the south. The meeting took place at Standerton on 26th July, 1900, and the line was then open for traffic.

The line to Klerksdorp was at this time undamaged, and was also reopened, but for some time it was little used by the Army.

On the 21st June traffic was opened with Pretoria. The large shops at that place were re-started with as little delay as possible, and all rolling stock, that could be found or repaired, was put in use.

It was not till the beginning of August that the railway from Pretoria to Middelburg was captured and opened for traffic. Here a halt was made until the last week of August, when the advance re-commenced, and continued right down to Komatipoort, to which place the line was repaired, and traffic opened on the 27th September.

For a long time Pienaars River was the northern railhead, but in April, 1901, the whole of this line up to Pietersburg was taken over.

## (2) REORGANISATION OF THE MILITARY CONTROLLING STAFF.

The controlling staff already existing was augmented and re-organised by the Assistant Director of Railways, who now moved from Bloemfontein to Johannesburg. In this he was assisted by Lieut. E. H. M. Leggett as Deputy Assistant Director. Captain Sutton, Coldstream Guards, who had hitherto been railway staff officer at Bloemfontein, was appointed Deputy Assistant Director at Johannesburg, while Captain J. L. J. Clarke, East Yorkshire Regiment, hitherto railway staff officer, first at De Aar, and afterwards at railhead during the advance, was appointed railway staff officer at Elandsfontein, with two assistants. This was the largest junction on the railway, and became the busiest and most important station (handling 2,000-3,000 wagons per 24 hours). Other railway staff officers were appointed where required.

## (3) REORGANISATION OF THE TECHNICAL WORKING STAFF.

The Director of Railways had a difficult task in replacing all the railway employées of the Netherlands Railway in the space of a few days. Considering that the various departments required over 3,000 employées, this was no small matter. During the halt at Bloemfontein a list had been prepared of soldiers serving with the Regular and Irregular Forces possessed of railway experience prior to enlistment. It was found that quite a considerable number of such men existed, and they were now called upon to leave their regiments and join the Imperial Military Railways. It was not easy to discover the qualifications of such a large number of men arriving almost simultaneously, many of whom had but slight knowledge of railway work. The majority, however, were eminently suitable and gradually fell into their right places.

Naturally, a large number of questions as to pay, clothing, orders for transfer, &c., affecting these men, cropped up, necessitating considerable correspondence with their regiments. To deal with this, the Railway Staff Depôt was formed, to which all men from regiments reported, and to which the railway officials applied for employées. This was at first under the direction of Captain Lloyd Carson, but was afterwards handed over to Captain Warry, of the Essex Regiment. This was a most necessary and useful department.

The following interesting account by Captain Leggett, R.E., fully describes the taking over of the Transvaal Railways, and shows the great difficulties the railway staff had to contend with, the chief of which, were—

- (a) Shortness of rolling stock, owing to the enemy's action in removing the majority of it.
- (b) Necessity of providing a completely new personnel, while the qualifications of all applicants were unknown.
- (c) The repairing of the vast damage done to bridges, buildings, permanent way and water stations.

*Narrative of the taking over of the Transvaal Railways.*

On May 27th Army Headquarters with the 7th and 11th Divisions and Corps troops crossed the Vaal at Viljoen's Drift and occupied the railway station of Vereeniging, the southern terminus of the Netherlands South African Railway system. For several days the rapid advance had carried the Army further from the railhead in rear. The damage to the Free State line had been so immense that the work of the construction train under Lieutenant Micklem, Royal Engineers, was unable to keep pace with the Army, in spite of every effort to expedite the work. The construction train was on May 27th still engaged on the large bridge at Rhenoster Spruit, 42 miles from the Vaal; while, within this length, heavy damages to the Leenw Spruit and Taibosch Bridges, besides many smaller works, were still awaiting repairs. From ten to twelve days must elapse before trains could run through to the Vaal. The bridge across this latter river—a high structure with seven spans each of 130 feet—had been destroyed on the 26th. The damage was not such as could be made good by hasty improvisation, and work on the old line of deviation, involving a long but low temporary bridge, was accordingly commenced on May 27th, and proceeded day and night. For this purpose the resources of the Vereeniging coal mines were freely made use of, the complete headworks of one shaft being dismantled to obtain timber for the temporary bridge. Technical labour was provided by "C" Pontoon Troop under Captain Travers, Royal Engineers, which was detached for the purpose from the main force, assisted by Lieutenant H. L. Pritchard, Royal Engineers, of the Director's staff.

With these arrangements under way, the Army marched north on May 28th, leaving a gap of 42 miles between its rear and the railhead supply depôt, a distance liable to be increased up to 71 miles should Johannesburg be reached before the repairs had been effected.

The position at this stage is worth recounting in some detail, to show the military significance of railway events which transpired within the next few days. With the exception of 26 engines and 349 trucks captured at Bloemfontein, no rolling stock had fallen into our hands since the enemy's country had been entered. Based upon the Cape Colony, the railway traffic of the entire force (exclusive of the Natal side) was dependent upon the locomotives and rolling stock of the Cape Government Railways, supplemented by such as might be captured from the enemy. The distance of the main Army from its base was increasing at such a rate that the best employment for each single locomotive had become a matter for the closest calculation, while the growing time taken for each truck to carry its load from the coast to the front and return could not, unfortunately, be yet balanced by the putting into service of additional rolling stock, but of the eight through trains daily, for which alone the available resources would suffice, approximately one was required to meet the daily consumption of coal by the railways themselves, and of the material necessary for repairs. The condition of the Vereeniging coal mines was consequently a matter of some anxiety during the advance, since the absence of damage to these would have the effect of diverting the coal traffic from the up direction, in which it displaced its military equivalent, to the down direction, in which it merely occupied trucks running otherwise empty. This hope was fortunately realised, and the resources of Johannesburg in



railway material and timber for bridge repairs, which shortly after became available, afforded similar relief.

With these facts in view, and facing the uncertainty as to the condition in which the railway between the Vaal and Johannesburg might be left, the Army marched out of Vereeniging. On the following afternoon the railway junction at Elandsfontein was occupied. Here were captured 8 locomotives and 200 trucks, all that were left of an immense accumulation in process of removal northwards by the enemy, but of incalculable value for the reasons given.

Elandsfontein is the key of the Transvaal Railway system, and indeed, from a military standpoint, of the whole railway system of South Africa. The Natal line, the trunk through the Cape Colony and Free State, and the northern extension to Pretoria for Delagoa Bay, all unite at this point, their only junction; while the branches to Johannesburg, Potchefstroom and the west, and to the Springs collieries on the east, make Elandsfontein the busiest traffic centre of the country alike in war or peace. As a matter of railway strategy, the seizure of such a station in full working order was of commanding importance.

The same night, one of the captured engines was despatched south to Vereeniging, with a train of empty trucks to meet certain expected ox convoys from railhead, and by transshipment to save the last 29-mile trek which the latter must otherwise make to reach the Army. A few only of the old railway officials could be induced to work.

Vereeniging was reached at day-break, and the contents of 30 ox wagons of supplies were rapidly transferred, and reached Elandsfontein by rail before mid-day on the 30th.

Meantime a railway staff was being improvised at Viljoen's Drift from among the late employes of the Free State Railway found at that station. Capt. Leggett, Royal Engineers, Deputy Assistant Director, temporarily representing the Director, placed a working staff in Vereeniging Station and proceeded the same evening to Elandsfontein, accompanying a second supply train for the Army.

The Army, which had arrived with depleted supply wagons, was again provisioned for an advance, while holding in reserve such supplies as might be found in the town of Johannesburg, which was still unentered.

At 10 a.m. on the 31st Lord Roberts commenced his march into Johannesburg. The small damage done by the enemy to the line between Elandsfontein and Johannesburg having been made good in the early hours of the morning, a supply train was run into Johannesburg goods yard, where 7 engines and 600 trucks were found.

During the night the few railway employes at Elandsfontein, who had more or less unwillingly worked for the British, absconded, and the situation became difficult. One assistant stationmaster and one engine-driver alone faced the consequences and continued at work. In the meantime, orders had been received from headquarters that two more supply trains and one trainload of siege guns were to be brought up at once from the Vaal in readiness for a rapid advance upon Pretoria. To do this it was necessary to utilise soldiers who had had railway experience prior to enlistment. The garrison at Elandsfontein Station consisted of two companies of the East Lancashire Regiment, under Major O'Brien, who placed them unreservedly at railway disposal. Among the men were several who, as reservists, had obtained railway experience upon English lines, and by their aid and that of Major Lewis, who assumed the duties of railway staff officer and stationmaster, the required traffic was duly brought up to the front.

Late on the evening of June 1st Col. Girouard arrived by road from the south. Having ascertained from the Netherlands South African Railway authorities that they had no intention of working the railway, he at once took charge, and with the assistance of Captain Leggett, Royal Engineers, proceeded to organise a new railway staff formed of soldiers with railway experience. The men were rapidly got into place. Old Free State Railway employes, collected at Viljoen's Drift, were brought up, and by June 3rd the organised railway staff north of the Vaal consisted of 160 men. On June 7th Major Murray, Royal Engineers, Assistant Director, Mr. Hoy, late of the Cape Railways, and now Traffic Manager of the Imperial

Military Railways, arrived at Johannesburg with further staff, having been delayed in laager during an attack by the enemy on the lines of communication near Taibosch. Meantime the Army had marched north from Orange Grove early on the 4th, and by the night of the 5th were outside Pretoria. A cavalry party under Major Hunter-Weston had been detached to the east to cut the Delagoa line, but the attempt was not successful. As the town came into sight, great activity was noticeable in the railway station, and one train in the act of departing was actually fired upon. This was afterwards found to have contained our own prisoners of war, who were being removed to Nooitgedacht. The further escape of engines and rolling stock was, however, prevented, and when Pretoria was occupied on the following morning, 16 locomotives and about 400 trucks were found. The station books disclosed the fact that during the last 48 hours no less than 70 trains, many drawn by two engines, had been sent east.

Again the question of supply traffic became imminent. During the advance from Johannesburg a depôt had been formed at Irene, 10 miles south of Pretoria, by rail, where the railway bridge over Six Mile Spruit had been destroyed. Work upon the necessary deviation had been already commenced by the 9th Company, Royal Engineers, under Major Jerome, and a train service to connect Pretoria with the south by portage across the Irene Drift was instituted. Colonel Girouard had visited Pretoria, obtaining a similar reply from the managing director of the Netherlands Railway to that given by his subordinate in Johannesburg; and a military staff was improvised in the same manner as at the latter place. Locomotive and traffic officers of Colonel Girouard's staff arrived on the 8th; and military traffic was at once working simultaneously to the south, to Waterval on the north, where our ex-prisoners of war had been removed, and to the outposts near Eerste Fabrieken nine miles to the east of the town.

After so rapid an advance a period of consolidation was as necessary to the railway organisation as to the other military administrative services. In nine days 80 miles of main communications had been added to the responsibilities of the Director of Railways, or over 120, if the short sections to north and east of Pretoria and the branches to Johannesburg, and Boksburg and Springs be reckoned. Nearly 1,000 trucks and several locomotives were at military disposal in the Transvaal, but from some of the latter vital parts had been removed, while others were too much out of repair to be of much use.

The staff were new to the stations and to each other. The foreign railway material in their hands offered many distinctions from that to which they had been accustomed on the railways of England and the Colonies, and lastly, the main lines of communications was still broken by the gaps at Irene and the Vaal, across which traffic was maintained by transport in ox wagons. The Vaal Bridge was ready on the 11th June, and Irene on the 19th June.

Railway employés were obtained largely by loan from the Cape Railways and from among the English staff of the late Free State Railways who had come out before the war, or, remaining at their posts under the Free State Government had not exceeded the purely railway functions of their posts or taken part in any act of hostility. There were also available, the officers and men of the 8th, 10th, 31st, and 42nd Railway Companies of Royal Engineers, strengthened by the men of the special Railway Reserve from home, the latter being employés of the great English companies specially enlisted for the purpose and passed at once to the reserve. Finally, there were the army reservists in the ranks of all regiments, and the men of colonial, militia, and volunteer regiments and companies who had been in previous railway employment in civil life, but whose qualifications remained to be ascertained and whose numbers were not officially known. This source of supply had not been utilised in previous campaigns, and depended principally on the voluntary coming forward of the men. By the inducement of working pay at Royal Engineer rates, from 800 to 1,000 of these men were discovered and proved of immense service. A railway staff depôt was established at Johannesburg to which all such men were sent by commanding officers, and here their qualifications were fully enquired into. Sub-depôts,

under the central dépôt, were subsequently started at large stations; and from these and from Johannesburg, demands for extra staff to meet the exigencies of military traffic and the opening of new mileage were supplied throughout the campaign. Railway staff officers were obtained from the troops. The number of such officers employed, from time to time, in the Transvaal alone totalled over 130, all of whom had practically to be taught their special duties in the absence of previous experience or the inclusion of such matters in the recognised educational *curriculum*.

On June 11th the Vaal was crossed, but the enemy having done extensive damage in the neighbourhood of Rhenoster to the bridges which had been temporarily repaired, it was not until the 21st June that the line was opened throughout. Soon after began the series of guerilla demolitions on the northern section of the ex Free State Railway, which did not cease for months.

General Hunter meanwhile was moving eastwards from Mafeking up the line of the Klerksdorp-Johannesburg Railway, not greatly damaged at the time, but afterwards subjected to more extensive destruction at the hands of the enemy. With the exception of the collection of a few trainloads of forage, this line was little used beyond Krugersdorp for a considerable time. By the end of June Heidelberg, on the line to Natal, had been occupied, and the line made good between Elandsfontein and that place, while No. 2 construction train, brought round on completion of the repairs to the Kimberley-Buluwayo Section, was at work on the Zuikerbosch Bridge, the then south-eastern outpost of Lord Roberts' Army.

Throughout June and the first half of July, an average of eight trains daily of supplies, remounts and reinforcements, was maintained between the advanced base at Bloemfontein and the front. The frequent though generally inconsiderable damage done to the Free State line by the enemy eventually rendered necessary the suspension of night running. This entailed the reduction of through traffic from eight to six trains daily, until after the bulk of the engines had been recaptured. Even then considerable risks were run by the railway men, whose endurance and pluck were never more forcibly exhibited.

Several troop movements of exceptional magnitude took place during this period. The most considerable of these was the concentration by rail of the Colonial and other Mounted Infantry Corps with their transport complete at Krugersdorp. These were carried from Kroonstad in five days, in a total of 31 trains, during which a traffic of three trains of military supplies, ordnance and engineer stores, and hospital equipment, was also maintained daily from the south into Pretoria.

Although not perhaps so much a matter of railway as of general staff administration, a word should be said as to the methods whereby the very limited resources of the single line of railway communication were allotted to ensure an equal attention to the requirements of the Army as a whole. The allocation of railway facilities was reserved strictly to the Chief of Staff, without whose order in each case nothing could pass by rail towards the front. The number of trains, or, more accurately, the number of trucks which could be hauled daily in the "up" direction, being communicated by the railway authorities to Lord Kitchener, he placed a number, liable to vary from day to day, at the disposal of the supply and remount departments, either generally for the maintenance of their dépôts or for specific traffic.

The number reserved for hospital, ordnance, engineer and special stores was even more closely calculated, and the demands of these departments had to be submitted for approval in the utmost detail. All authorisations were passed to the railway representative at Headquarters, whose business it was to notify when the total of such orders outstanding for despatch from the advanced base was exceeding the accommodation which could be provided within a reasonable time under the scheme of proportion in force for the time being. In such case the issue of permits fell temporarily into abeyance, or the outstanding list was revised to accord with the necessities of the moment. No truck could be loaded and no troops despatched by rail without such authority, with the single exception of details and small parties, who were invariably made to travel upon the loaded supply trucks. Proposed troop movements by rail requiring separate accommodation had to be carefully

considered in view of the supply traffic they would displace, and when time admitted were generally made by road. It was this system alone which co-ordinated the railway requirements of the various departments, and did so much to falsify previously accepted figures as to the limits of the fighting force which could be maintained by a single line of railway.

On July 23rd the advance eastwards along the Delagoa line commenced. For some weeks the 11th Division and mounted troops had been encamped near Eerste Fabrieken, which had remained the eastern railhead. A supply depôt had been formed at this point, which had consequently been the scene of some railway activity. Forces operating from Rietfontein Farm, 12 miles south-west of Pretoria, were based temporarily on Irene Station, while the terminus of the Springs Branch (which had been more than once evacuated and reoccupied by our forces) gave General Hutton's force the advantage of railway communication up to their starting point for the east. The right of the British line at Heidelberg possessed similar facilities. A construction train fully equipped to cope with anticipated damage to the Eastern line was moved out from Pretoria, and upon the 24th was engaged upon a small bridge near Van de Merwe station. Bronkhorstspuit, 39 miles from Pretoria, was reached by Army Headquarters on the night of the 24th, and by the construction train at midnight on the 25th.

A considerable length of railway communication had thus been already seized, but running, as it did, parallel to the bush, from which the enemy were known not to have been completely cleared, such a line was clearly liable to be cut at any moment. Four supply trains had been following the construction train, and four more were at once ordered up by Lord Kitchener to form a depôt at Bronkhorstspuit, from which the troops on the right flank, as well as the main body, could draw for the further advance.

Balmoral, 16 miles further, was entered on the evening of the 25th, but between this and the last halting place, the two large bridges over the Bronkhorstspuit and Wilge River had been totally destroyed, cutting off hope of through railway communication to the east till the necessary deviations had been completed. The railhead station staff at Bronkhorstspuit were warned to expect a heavy traffic at that station, both of material and supplies, and Captain Fuller's construction train was hurried to the front. On the same day news arrived that the mounted troops had cut across the line at Brugspruit, further to the east, and that the enemy were in full retreat beyond Middelburg.

On the 26th, the Field Marshal and Headquarters Staff returned by rail from Bronkhorstspuit to Pretoria; and the advance of our troops (continued during the next few days), discovered the line to be without further damage as far as Wonderfontein, 29 miles east of Middelburg, and 123 miles from Pretoria. The Boer trains had been running into Balmoral until within two days of our entry. So hasty had been the retreat that carefully prepared charges laid in the piers of the Olifants River Bridge by the Italian commando had not been exploded. The presence of mind of the Netherlands railway men had not however deserted them. In the course of the 123 miles of captured railway not one locomotive or truck was left.

The deplorable condition of the road between Bronkhorstspuit and the new front, due to heavy rains, made the supply of the considerable force now centred around Middelburg, a matter of some difficulty for the ox and mule transport. In the hope of finding railway plant along the line, a special mule wagon had been fitted by the Locomotive Superintendent in Pretoria to act as a travelling workshop. A few enginemen and fitters accompanied this wagon, which was permitted to march with the Headquarters Staff. Pushing forward beyond the broken bridges, the railway staff officer, Lieutenant McConaghy, Royal Scots Fusiliers, obtained the aid of the Royal Engineers to convert a few platelayers' trollies into improvised trucks, and with these and a couple of small and rickety colliery shunting engines discovered on a siding, organised a species of train service between Middelburg and the break in rear.

By these dangerous means a few tons of supplies were each day carried over the interval of 40 miles, until the deviation works were completed for through traffic. This took place on 6th August, or nearly simultaneously

with the wearing out of the last wheels of the last trolley subjected to so rough a treatment, despite the stoppages made at every two miles of their journey to grease the axles.

But while things were going so well in the east, the activity of the enemy under De Wet on the southern line of communication was increasing. South of the Vaal interruptions to traffic from this cause was seriously diminishing the carrying capacity of the railways.

The extension of the total mileage worked, owing to the successes just mentioned, naturally threw more work on the engines and rolling stock, the numbers of which had of course received no corresponding increase. On these grounds alone the driving of General De Wet and Commandant Theron away from the railways was a matter of urgency. Further concentrations of British troops were effected by rail along the line from Kroonstad to Viljoen's Drift, and about Krugersdorp. Lord Kitchener proceeded to the latter place in person, and then to Rhenoster to take command of the operations which were to follow.

What happened during the second week of August illustrated the use of the railway in offensive tactics. General De Wet, having broken through the Magaliesburg, was heading north, with the intention of turning to the east to join General Botha to the north-east of Middelburg. He was moving with great rapidity, and the bulk of the British mounted troops were in the rear of him. Lord Roberts decided to use the line which runs due north from Pretoria towards Pietersburg, to head off the enemy. The line was known to be damaged in several places, and a construction train was accordingly despatched up it, accompanied by the brigades of Generals Paget and Clements; the mounted troops of General Baden-Powell and part of General Hamilton's force, marching in from Magaliesburg, were transported by rail. The railhead was able to keep ahead of the enemy, who was caught and driven north-west near Warmbaths Station, 60 miles north of Pretoria. The line was explored as far as Nylstrom, and a few trucks found, and after the construction of a deviation round the damaged Pienaars River Bridge, the further extension of this line was not proceeded with. Pienaars River was garrisoned and remained a terminus for some months. Towards the middle of August preparations for a resumed eastern advance commenced on a great scale. Four trains of supplies daily had been running to Middelburg, and to Wonderfontein for the formation of a dépôt. General Buller's troops had worked northwards from Standerton towards Belfast, and their requirements thus fell upon the eastern line of communications, necessitating a further increase of supply traffic and increased demands upon the engines and rolling stock. At this time no less than 3,000 Cape Colony trucks were in regular use north of the Orange River, while 15 engines were on loan from that administration to the Imperial Railways. Natal trucks, which until August 15th ran to Standerton only, were permitted to work through, and two engines were lent by that Colony, which subsequently increased the number to four. So straightened was the situation that the loss of two engines one on the Krugersdorp line and one near Kroonstad, was acutely felt in the working. The number of trains running north of Bloemfontein were reduced to find engine power for the Eastern line, and calls had of necessity to be made upon the reserve supplies collected in Pretoria.

On August 24th, Lord Roberts went east to Belfast, which had been occupied on the previous day, and for another week the Eastern line was crowded with troop traffic, including the movements of General Hamilton's division, General Smith-Dorrien's brigade, and other units. From eight to ten trains were run daily, and it was with the greatest difficulty that the small stations at which the troops had to detrain could be kept clear. The locomotive water supply at some stations proved insufficient, and had to be supplemented by travelling tanks, while the construction of auxiliary platforms and the installation of a portable electric light by the Electrical Engineers were some of the measures taken to cope with the work. From Belfast eastwards not a single troop unit was carried by rail.

The battle of Bergendal followed: Waterval Boven, at the head of the rack section of the railway, was occupied on the 29th, and a supply train was run into that station while desultory firing was still proceeding on the surrounding hills. The formation of an immense supply park was commenced

at Machadodorp from which the central force and the columns to operate on either flank were to be provisioned. The 9·2" gun, thirty tons in weight, which had been mounted on a railway truck at the Cape Town railway works, was brought up to Machadodorp under the charge of the Cape Volunteer Artillery, but unfortunately had no opportunity to fire.

Lieut. Micklem's construction train proceeded to Waterval Onder, the foot of the rack section of the railway, which drops 900 feet at this point in a distance of barely four miles. The tunnel and rack had fortunately been left intact, but the special rack locomotives had been removed. Until these were recovered it would be necessary to employ ordinary engines with a very much reduced load, and to take other special measures of precaution against the dangers of breakaways on the steep gradient. The capacity of the rack section under these conditions did not exceed 40 truck loads per diem, increased later to 60 when two heavy Natal locomotives were brought up for this special work. Fortunately the end was approaching, and the traffic now required would be limited to supplies. As soon as the various columns were well advanced towards Lydenburg and Barberton respectively, Lord Roberts moved to Machadodorp.

The construction train, after repairing some minor damage, moved down the Elands Valley to Godwan River on September 13th, and under the protection of the 11th Division commenced work on the large bridge near that station. On the 15th news was received of General French's entry into Barberton, with the capture of 43 locomotives, of which 27 had been rendered temporarily useless by the removal of vital parts.

The Guards Brigade was making its way towards Kaapmuiden, the junction of the main line and the Barberton Branch, and General Stevenson's Brigade was pushing over the hills to strike the main line at the intermediate station of Nelspruit. Both these columns reached their objectives on the 18th, the construction train, which had finished the Godwan Bridge on the 16th, arriving at Nelspruit in advance of the troops. Army Headquarters moved to Nelspruit the same day. The lines of railway recovered within that period were examined and the gains counted. At Nelspruit, itself, six locomotives were found and about 80 trucks, many being evidently damaged in a recent accident; at Kaapmuiden, 18 engines and about 80 trucks, many destroyed by fire, together with the supplies they had evidently contained; and at Avoca, half way between Kaapmuiden and Barberton, another 52 engines were found by the Cavalry Division.

On the other hand, the large bridge over the Kaap River, just west of Kaapmuiden, had been destroyed, together with a smaller one not far from Krokodilpoort. The Avoca Bridge had been blown up, and Barberton was cut off from railway communication till a deviation had been built. This was at once commenced by the Royal Engineers of the Cavalry Division, who also started a local train service between Barberton and Avoca. The Engineers of the 11th Division followed suit between Avoca and Kaapmuiden, until the regular railway staff could add these sections to the general system.

Most fortunately, a large stock of railway material was found at Krokodilpoort, thereby reducing the demands on the carrying power of the rack section. This was as busy as its capacity allowed, trains being brought down to form supply depôts at Godwan and Nelspruit, the latter being, for some days, the most advanced depôt.

Krokodilpoort Bridge, commenced on the 19th, was finished on the 22nd, when the construction train ran forward to the Kaap River, where a heavy work awaited it. A trestle bridge, 20 feet high and about 60 yards in length, was required, while the approaches on each bank, although short, entailed a considerable amount of earth cutting. The deviation was completed on September 27th, Komatipoort Station having been occupied by our troops two days earlier. The Kaap Bridge could have been finished a day earlier had not much of the available labour been employed in portaging across the river supplies, which were then despatched by rail to the Cavalry Division *via* Avoca, at which place a second portage was necessary before they could reach General French.

General Pole-Carew, in marching down the railway, had found small bridges broken between Malalane and Hectorspruit and between Hectorspruit

and Oorsprung; and to admit of the simultaneous repairs commenced to these under Lord Kitchener's personal supervision, more of Lieut. Micklem's men had to be taken off the Kaap deviation to carry railway material across the river. All were done by the night of the 27th, and an unbroken line of rail in British hands extended from Cape Town and Durban to the Portuguese frontier.

Komatipoort Station exhibited the most extraordinary scene of confusion and wanton destruction. The frontier bridge had been spared, but the station buildings were a total wreck, a thousand tons or more of coal piled in the locomotive yard were ablaze, and the iron frames of hundreds of burnt trucks stood up amid the ashes of others yet more totally ruined. Many, indeed, were smouldering still, and the hot ashes and other refuse which littered the ground made it difficult and dangerous to walk along the sidings. Add to this a high wind which lifted ashes and every kind of filth into a whirlwind, and, pervading all, the sickly odour of burning food-stuffs. It was imperative to remove at once as many troops as could be spared from a spot which was notoriously unhealthy. Almost before the railway plant could be inspected, measures had been taken for the return of the 11th and General Ian Hamilton's Divisions by rail.

The coal fire was smothered with sand; the damaged engine water supply was patched up, and a temporary manual supply added. No less than 103 locomotives and 2,645 trucks and carriages were found. Several of the former, principally those belonging to the Free State and Natal Railways, had been partly dismantled, apparently some months before. About 500 trucks were more or less damaged by fire, and 115 of these were totally destroyed. Of the trucks found 200 belonged to Natal, and about the same number to the Cape Railways, while the balance formed the rolling stock of the Netherlands Railway, which had been so regularly withdrawn before our advance. Eight and a half miles of the main line of the Selati Railway were blocked with trucks, as well as  $4\frac{1}{2}$  miles of sidings. The storage of these had apparently commenced in May, when the Natal trucks were first pushed up the Selati line, where they were all found together. At every hundred yards the rails were slightly displaced, while each trainload of 20 to 30 trucks, as it had been pushed up, was secured by sleepers placed across and chained down to the line. Near Komati a number of sidings had been hastily thrown down upon the veldt, filled with trucks, and then disconnected from the main line.

In the station itself were the engines and a number of complete trains of trucks with engines attached, which had evidently been allowed to grow cold where they stood, and which by their contrast to the orderly method of disposal of the other plant, testified to the haste with which the enemy's railway operations had been brought to a close.

To deal with this mass of plant, so badly required on the main line south of Pretoria, a considerable staff was required. The Imperial Military Railways had already been taxed to the utmost. Again the troops were called upon to provide men of railway experience, and a large number came forward, among whom, after trial, some excellent men were found. Captain Leggett took charge of the general arrangements, while Lieutenant Newcombe, Assistant Locomotive Superintendent, had the task of putting into running order and of providing men to work the 160 engines captured in the past fortnight. The first troop train, carrying the Coldstream Guards, left on the 28th, driven by an army reservist from its own ranks. The whole force, except the small permanent garrison of the place, was despatched by the 10th of October in a total of 102 trains. The special rack locomotives were among the first to go, and by their aid the capacity of the rack section was doubled.

At the same time, owing to the presence of the enemy near the line between Waterval and Pretoria, night running was stopped on that section from the beginning of October, and the output from Komatipoort had to be regulated by what could be carried over the Eastern Section, or roughly 120 trucks daily. Towards the end of October the enemy's trucks temporarily across the Portuguese border began to return into the Transvaal, and 1,260 in all were thus received. Occasional storms showed that the wet season was near, and several times it was necessary to suspend traffic to examine or repair the temporary bridge.

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terna & Northern Lines	W. M. Barrett
Transvaal.	
W. Carr. Esq. <sup>rs</sup>	





The necessity of maintaining traffic with Lorenzo Marques, both for civil and military purposes, added somewhat to the work. On November 14th the clearance from Komatipoort was finished; by the 16th all trucks and engines, except those left working stock, were safely across the Kaap River deviation, and by the night of the 18th the line between Komatipoort and Waterval Boven had been relieved of everything surplus to the working needs of the district.

A total of 222 engines and 4,250 railway vehicles had been recovered on the Eastern line, and returned to the Colonies or distributed over the Imperial Military lines.

The accompanying charts show the organisation which was established for the administration and control, not only in working the Imperial Military Railways, but on all the railways in South Africa, which had now fallen into our hands, forming a network over the whole theatre of operations.

Chart No. 1 shows the organisation at first established, which remained in force until December, 1901, practically unchanged. When, however, the country began to settle down and the Civil Administration began to take up its duties, the Director of Railways had considerable addition to his work in anticipation of the termination of hostilities, and the consequent transfer of railways to the Civil Government, while he still continued in his position as Director of Railways to the Commander-in-Chief. Consequently the organisation was re-arranged as in Chart No. 2, in which it will be observed that Lieut.-Colonel Cowie was appointed General Manager of the Imperial Military Railways, taking his orders both in civil and military questions from the Director of Railways. The Controlling Staff became thus more than ever divided from the Technical Working Staff. This organisation gave satisfactory results.

On the 1st of July, 1902, peace having been concluded, the railways were handed over to Civil Government.

#### (IVc.)—IMPERIAL MILITARY RAILWAYS—RECONSTRUCTION.

##### (1)—CREATION OF THE WORKS DEPARTMENT.

As already related, on arrival at Bloemfontein, Captain W. D. Waghorn, Royal Engineers, was appointed Superintendent of Works, and he took over from the Orange Free State Chief Engineer the Engineering Department, which he proceeded to administer, as regards maintenance and routine, on the lines already in force. He found nearly all the staff, from the District Engineers down to the gangers, together with the office staff, at their posts. A considerable quantity of tools and material was also available. All arrangements for repair of the lines were placed in Captain Waghorn's hands. Royal Engineer officers and companies were placed at his disposal, and power given to him to engage civilian employes and native labour when necessary to supplement the Royal Engineers.

The main principles kept steadily in view were :—

- (1) To make the speediest temporary repairs possible in order to get a line of some sort through with the least possible delay.
- (2) Simultaneously to commence high-level trestle bridges on concrete foundations where required in order to do away with the disadvantages of long deviations with steep gradients and sharp curves.
- (3) To commence without any delay all permanent repairs, viz. :—rebuilding the masonry, repairing the girders or replacing them with new ones in order that the line should at an early date be restored to its former standard and rendered entirely safe against floods.

While leaving these in the hands of the Royal Engineer railway companies and the Railway Pioneer Regiment, Captain Waghorn re-established, as the lines were taken over, the usual civilian maintenance staff of District Engineers, &c.

(2a)—TEMPORARY RECONSTRUCTION IN THE ORANGE RIVER COLONY.

On the 3rd May, 1900, Lord Roberts commenced his advance from Karree northwards. On the 7th May, General Hunter commenced to advance from Kimberley and Fourteen Streams towards Mafeking. A large amount of work was rapidly carried on behind the advance on the Western Line, and General Hunter has expressed his appreciation of the results attained.

For reasons explained later under the heading of Traffic, the existing organisation of the Field Railway Sections was abolished after our arrival at Bloemfontein, and these, having been deprived of their traffic and locomotive departments, were now simply large construction trains.

For the advance through the Orange River Colony hasty temporary repairs were entrusted to Lieutenant H. A. Micklem, D.S.O., R.E., who was given a construction train, consisting roughly of 150 Royal Engineers, supplemented by some civil gangers and natives, varying in number at different times from 300 to 1,000, while infantry working parties were obtained wherever possible.

The enemy in their retirement from Bloemfontein had thoroughly and completely disabled the line behind them in an unprecedented manner. Practically every bridge and culvert was destroyed, including the very large bridges at Vet, Zand, Doorn, Vaalsche, Rhenoster, and Vaal Rivers, consisting of several spans of 100 feet over deep ravines, while broken spans ranging from 9 feet to 75 feet were numerous. At most places the water supply had been destroyed, and frequently the permanent way itself was blown up for several miles. The damage done, and the vast amount of work carried out by the construction parties in repairing it, can be understood by referring to Appendix B.

The advance of Lord Roberts was exceedingly rapid, nevertheless communication was opened with Johannesburg by Lieutenant Micklem's party 11 days after the arrival of Lord Roberts at that place, and with Pretoria 16 days after the arrival of the Army there, an accomplishment which excited universal admiration. On the western side communication was opened with Mafeking on June 9th, 1900, 13 days after its relief, the repairs being nearly on the same scale as in the Orange Free State.

After the line had been repaired as far as Johannesburg, Commandant De Wet made a raid on the 8th June, 1900, and destroyed the temporary works on 30 miles of line. But the Works Department were indefatigable, and communication between Cape Town and Pretoria opened for the first time on 21st June, 1900.

The new arrangements, by which the Field railway sections were replaced by "Construction trains" only, while the officer commanding the construction train had power to control the traffic between railhead and the last station, worked well, and this is undoubtedly the right system to adopt.

A very heavy piece of work, namely, the diversion and the low-level bridge at Kroonstad, was carried out by the Royal Engineer Field Companies, during the time that the Army halted there, so that on the arrival of the construction train, it was able to run straight through to the next break.

After the Army left Kroonstad, an officer of the Works Department was told off to accompany it, in order to make similar arrangements for getting work done ahead of the "Construction train" if possible. This was found to be a satisfactory arrangement, as, on arrival at the Vaal River this officer was able to commandeer the natives of the colliery and also a large amount of timber in the possession of the colliery, and with the assistance of C Pontoon Troop made a diversion and low-level bridge

over the river, which was completed by the time the construction train arrived.

(2b)—SEMI-PERMANENT AND PERMANENT RECONSTRUCTION IN THE  
ORANGE RIVER COLONY.

The construction of semi-permanent bridges over the deep ravines in the Orange River Colony was placed in the hands of Lieut.-Colonel Capper, R.E., and the Railway Pioneer Regiment. It was necessary that these bridges should be constructed as soon as possible as the diversions with their steep approaches were a great hindrance to traffic. Moreover, during the wet season these diversions were liable to be washed away.

The following is a summary of the work carried out by the Railway Pioneer Regiment :—

- (1) Temporary repairs, Rosmead to Stormberg.
- (2) High-level bridge, Norvals Pont, permanent reconstruction.
- (3) Deviation and low-level bridge, Bethulie.
- (4) Semi-permanent high-level trestle bridge, Vet River.
- (5) Semi-permanent high-level trestle bridge, Zand River.
- (6) Semi-permanent repair, high-level bridge, Vaal River, Vereeniging

Towards the end of July the Railway Pioneer Regiment, with the exception of two companies, was taken off railway work, and employed as police for the defence of Johannesburg. Two companies remained on railway work till the end of August, and then joined the remainder.

The Superintendent of Works lost no time in undertaking permanent reconstruction, in order that the line might be restored to its normal condition before the wet season set in. The girders ordered in England immediately on the outbreak of war were now of great use. They had been waiting at the coast ports, and were now quickly railed up to the damaged bridges. They were not in themselves sufficient to supply all that was required, but a large amount of steel plate had been ordered, and, with this and the undamaged portions of the broken girders, numbers of complete girders for large spans were made up. Masonry work was put out to contract and every inducement was given to hasten it.

(3)—RECONSTRUCTION IN THE TRANSVAAL.

The first repairs called for in the Transvaal were at Irene Bridge, between Johannesburg and Pretoria, and on the South Eastern line, in order to open up communication with Natal. The only heavy piece of work before meeting the Natal construction parties was at Zuikerbosch, at which place the construction party under Captain Fuller, Royal Engineers, was attacked by the enemy whom he succeeded in driving off, and on the 26th July, 1900, the Natal repairing parties were met by ours at Vlakfontein, and traffic with Natal was re-established.

The Irene temporary bridge was built by the 9th Field Company, Royal Engineers.

The repairs, both temporary, semi-permanent, and permanent were carried out on the principles already adopted in the Orange River Colony.

The work, though heavy, was carried out by the repairing parties with great rapidity, as may be seen by reference to Appendix C.

(4) SUMMARY OF RAILWAY ENGINEERING WORK.

A list of the damage done to the Cape, Orange Free State and Transvaal Railways, which was repaired by the Director of Railways' Department, is shown below. On the Cape Railways temporary repairs only were made, permanent reconstruction being left to the Cape engineers, but in the Orange Free State and Transvaal all permanent as

well as temporary reconstruction was carried out by the Director's Works Department:—

13—130' spans.	1—50 metre spans.
29—100'	1—37
5—80' "	9—30' "
5—75' "	5—25' "
20—50' "	12—20' "
17—30' "	7—15' "
31—20' "	5—10' "
2—12' "	18—5' "
98—9' "	

Also 20½ miles of new lines were constructed in laying down diversions to low-level bridges. About 15 miles of permanent way were relaid and several miles of temporary sidings were put in to accommodate extra traffic. The repairing of the railway kept pace with the advance of the Army in almost every case. The longest interval of time between the arrival of the Army and the railhead party was 11 days. In addition, repairs were made to breaks of the line done by the enemy between 6th June, 1900, and the 20th May, 1901, that is, after the railways had been repaired and opened for traffic, and only on two occasions was traffic, during the day, suspended for more than a few hours owing to repairs to the line.

#### (5) NEW CONSTRUCTION.

The Director, on arrival at Johannesburg, was asked to find employment for a large number of natives who were in the various mine compounds, for it was feared they would be a nuisance if not kept at work. Consequently, he decided to commence the construction of a line from Elandsfontein through the mines down to Vereeniging, the want of which had long been felt. As this work has nothing to do with the progress of the war, no further reference need be made to it here.

Since the theatre of war was well provided with a network of railways, and the shortage of rolling stock continued until March, 1902, the Commander-in-Chief did not consider it necessary to construct many branch lines. The only exceptions were two much needed railways, one from Bloemfontein to Ladybrand, and the other from Harrismith to Bethlehem.

The Bloemfontein to Ladybrand line was commenced on 1st October, 1901, and within one month had reached Sannah's Post, 21 miles distant, to which place the earthworks had been made before the war. From this point it continued more slowly in the direction of Ladybrand.

The line from Harrismith to Bethlehem was commenced in January, 1902.

#### (6) EXPERIENCE GAINED.

The necessity of carrying out rapid temporary repairs by the Royal Engineers under Royal Engineer officers experienced in railway construction has been clearly proved. Reasons have already been given why they have an advantage over a civilian engineering department, and it is desirable, therefore, that in future the repairs should be in the hands of Royal Engineer officers and men skilled in railway construction, under the orders of the Director of Railways.

The formation of an Engineering Regiment, such as the Railway Pioneer Regiment, must not be considered to be a substitute for Royal Engineer Companies under railway Royal Engineer officers for temporary hasty repairs. The proper work for a regiment of Pioneers is semi-permanent and permanent repairs, for which they are eminently suited.

On no account should railway bridges be also used as road bridges by boarding them up to make them suitable for carts. This is a most dangerous practice. It is not the danger to individuals which matters, but the danger to a large bridge which may delay the advance of the Army. An extra-

ordinary case of this occurred when the high-level bridge over the Orange River (the western one), which was the only one in our possession, and the most important point, at that moment, of the campaign, was boarded over and used as a road bridge, when a temporary road bridge would have been erected by the Royal Engineers if they had been requested to do so. On one occasion an engine was derailed by an ox wagon, and only just escaped falling through the bridge, and the number of occasions on which a similar accident was only just averted were numerous. If such an accident had really been serious, considerable inconvenience and delay in supplying the Army would have resulted.

## (IV D.)—IMPERIAL MILITARY RAILWAYS—LOCOMOTIVE DEPARTMENT.

### (1) CREATION OF THE LOCOMOTIVE DEPARTMENT.

On arrival at Bloemfontein, the Orange Free State Locomotive Superintendent handed over his department to Lieut. A. G. Stevenson, D.S.O., Royal Engineers, who proceeded to restart it on the same lines as hitherto in force. The employes who had left the Free State on the outbreak of war and had placed themselves under the Director in Cape Colony were reinstated in their positions, as far as possible, while vacancies were filled up and augmentations to the staff made by calling upon soldiers who had had railway experience prior to the war. The limited rolling stock captured was taken over and the well-equipped workshops restarted.

### (2) WORK IN THE ORANGE RIVER COLONY.

#### (2A.) *Temporary Work in Following up Army.*

When the Army advanced northwards from Bloemfontein the whole railway rapidly fell into our hands. The Locomotive Department was kept very busy taking over the limited rolling stock captured and making temporary hasty running arrangements under abnormal conditions, while the damage to the water supply had to be repaired with the utmost possible despatch. A small party of fitters and pumpers was attached to the construction train for this purpose.

#### (2B.) *Workshops and Rolling Stock.*

The workshops at Bloemfontein were well equipped with the necessary machinery, and a vast amount of work was done by them in the repairing of damaged rolling stock, while a great deal of unusual work of the greatest use to the Army was carried out, such as repairs to and mounting of guns and the armouring of trains.

Throughout the war the want of rolling stock was much felt, owing to the action of the enemy in removing the bulk of it in their retirement, and the vast amount of damage done to it by them. The steps taken to provide new rolling stock and to repair that which was damaged are fully explained in the tables which will be found a few pages further on.

### (3) WORK IN THE TRANSVAAL.

#### (3A.) *Taking over of the Transvaal Railways.*

On the capture of Pretoria and Johannesburg the headquarters of the Locomotive Department were moved to Pretoria, where the well-equipped shops and sheds of the Netherlands Railway existed. Smaller shops were found at Johannesburg and Waterval Boven.

The Director, while at Bloemfontein, had to make preparations for a staff of officials and employés to take over Traffic and Locomotive Departments, working 1,130 miles of line which would fall into our hands during the course of the next few weeks, and it was now that the want was severely felt of a number of trained traffic and locomotive employés who might have been registered in peace time for work with the Army in war. Considering that the Traffic and Locomotive Staff required for working the Transvaal and Free State lines numbers over 3,000 white men, it was a matter of considerable difficulty to improvise so large a staff at short notice. The Cape Government Railways were drawn on to the fullest possible extent. Employés of the Free State Railways had to be used, in spite of the possibility that several of them might be hostile if opportunity occurred. Posts of minor importance requiring least skill were filled by raw novices, and arrangements were made to fill the remaining posts by obtaining the Commander-in-Chief's permission to call on all soldiers possessed of railway experience to volunteer for work on the Imperial Military Railways. It was found that the numbers were large, a great many of the Colonial contingents containing a number of railway men, as well as the Regular Army. Lists were prepared at Bloemfontein of these men, and arrangements made for getting their services as required.

It was decided that those selected should be given engineer pay at rates varying according to their qualifications, from 4*d.* to 1*s.* 8*d.* per diem, in addition to their regimental pay. Owing to the high rates customary in South Africa for civilian railway employés, the soldier was at a great disadvantage in this respect, and it was expected that, working side by side with civilians at high rates of pay, the soldier might be discontented; but of course they were in a different position, having come out for the war and all its varied duties, and, as a matter of fact, there was very little discontent among the soldiers on this account. Later, all soldiers who had completed colour service were paid as ordinary civilians.

The Locomotive Department had to face the same difficulty as the Traffic Department in obtaining personnel. It was met in the way described above, but the difficulty of working with untried men was more pronounced in this department than in any other.

The following return shows in approximate detail the Locomotive Staff of the Imperial Military Railways and how it was provided:—

Number provided by the Royal Engineers Railway Companies ... ..	79
Number provided by men taken from the Army	279
Found in the Free State and reappointed ...	154
Railway refugees from the Orange Free State reinstated ... ..	303
Found in the Transvaal and reappointed ...	13
Railway refugees from the Transvaal reinstated...	54
Transferred from the Cape Government Railways and replaced by men from England ... ..	136
Transferred from the Natal Government Railways and replaced by men from England ... ..	57
Received direct from England ... ..	12
Obtained elsewhere ... ..	965
Total number required ... ..	<u>2,052</u>

There were also 743 natives in the Locomotive Department in September, 1900.

(3B.) *Temporary Work in following up Army.*

From the account already given of the capture of the Transvaal Railways, the enormous amount of work which devolved upon the Locomotive Department in order to get running arrangements restarted and the damaged water supply repaired may be conjectured.



(3c.) *Workshops and Rolling Stock—Transvaal.*

The workshops at Pretoria and Johannesburg were worked to their fullest capacity in order to repair the damaged rolling stock, and they also carried out a great deal of other useful work in the way of armouring trains and mounting guns.

The new rolling stock from England was erected at the Cape and Natal ports by the Cape and Natal Government Railways respectively.

The following tables give full details of the way in which the rolling stock was augmented and repaired, and from this the output of the workshops may be gauged.

## ROLLING STOCK.

The following tables illustrate—

- (1) The scarcity of rolling stock at the commencement of the campaign ; (2) The way in which this scarcity became increasingly felt as the length of railway in our hands extended ; (3) The systematic way in which the enemy withdrew the bulk of rolling stock with them ; (4) The extensive damage done by the enemy to rolling stock ; (5) The steps taken to replace this by ordering new stock and repairing as much as possible.

## BALANCE OF ROLLING STOCK ON THE ENEMY'S SIDE AT THE OUTBREAK OF THE WAR.

	Engines.	Coaches.		Equivalent of Short Trucks.	Trucks.	
		Bogie or 8-wheeled.	Bogie or 6-wheeled.		8-wheeled.	6-wheeled.
Cape Government Railways rolling stock running prior to war ..	475	640	25	8,581	..	..
Natal Government Railways rolling stock running prior to war ..	146	197	48	..	980	545
Total running prior to war .. .. .	621	837	73	8,581	980	545
Cape Government Railways rolling stock in traffic on our side after outbreak of war ..	423	540	25	7,041	..	..
Natal Government Railways rolling stock in traffic on our side after outbreak of war ..	140	178	36	..	830	533
Total after outbreak of war .. .. .	563	718	61	7,041	830	533
Balance on enemy's side of border not available	58	119	12	1,540	150*	12

\* Equivalent to 300 short trucks.

As the railways were recaptured, the enemy succeeded in withdrawing nearly all the rolling stock, so that the scarcity became more and more noticeable. A certain amount of rolling stock was captured at Kimberley, Vryburg, Bloemfontein, Johannesburg, Standerton, Pretoria and other places, but the

bulk of it was not recovered till Barberton and Komatipoort were reached, as may be seen from the following table:—

# ROLLING STOCK RECAPTURED FROM THE ENEMY.

(Approximately.)

Captured from Enemy, or released from Siege at	Date.	Engines.	Coaches and Trucks mixed, equivalent to Shorts.	
Kimberley .. .. .	19.2.00	20	15 coaches 368	
On the line between Kimberley and Mafeking .. .. .	29.5.00	27	Not recorded	
Bloemfontein .. .. .	13.3.00	28	27 coaches 325	
Vereeniging .. .. .	24.5.00	1	..	
Elandsfontein.. .. .	29.5.00	8	200	
Johannesburg, Braamfontein ..	31.5.00	7	600	
Randfontein .. .. .	June, 1900	5	..	
Potchefstroom .. .. .	11.6.00	8	..	
Springs Branch Line .. .. .	2.6.00	4	..	
Standerton Line .. .. .	July	19	..	
Pretoria .. .. .	5.6.00	4	400	
Ditto, in shops for repair .. ..	5.6.00	13	..	
Pretoria-Pietersburg Line .. ..	March, 1900	2	30	
Waterval Boven .. .. .	29.8.00	1	..	
Nelspruit .. .. .	18.9.00	6	80	
Kaapmuiden .. .. .	20.9.00	19	80	Several of these trucks destroyed.
Barberton .. .. .	15.9.00	44	..	27 engines damaged.
Avoca .. .. .	17.9.00	52	..	
Komatipoort .. .. .	27.9.00	103	2,645	About 500 trucks and many engines dam- aged or destroyed.
Handed over from Delagoa Bay ..	October, 1900	8	1,260	
<b>TOTAL .. .. .</b>	<b>..</b>	<b>367</b>	<b>6,033</b>	

Other rolling stock was captured, but numbers, places and dates have not been recorded.

The recapture of rolling stock did not entirely put matters straight, for a large quantity was damaged as may be seen from the following table, which also shows the numbers repaired ; but of course repairs on such an extensive scale took time :—

#### ROLLING STOCK DAMAGED BY THE ENEMY AND REPAIRED BY THE BRITISH.

	Engines.		Coaches.		Trucks (equivalent in shorts).	
	Damaged.	Repaired.	Damaged.	Repaired.	Damaged.	Repaired.
Cape Government Railways up to 31st March, 1901 .. .. .	10	10	23	19	261	57
Natal Government Railways up to 31st March, 1901 .. .. .	5	5	Nil	..	Nil	..
Imperial Military Railways up to November, 1901 .. .. .	87	66	6	6	694	336
Total.. .. .	102	81	29	25	955	393

The withdrawal and damage of rolling stock had been anticipated. New rolling stock had therefore been ordered. The amount erected and brought into traffic between July, 1900, and March, 1901, on the Cape Government Railways, and between December, 1900, and June, 1901, on the Imperial Military Railways, is shown below. More rolling stock was on order and was erected subsequently. The first order for rolling stock was placed immediately on the commencement of the war in October, November and December, 1899, but none of this was in use before July, 1900, after the occupation of Pretoria, and most of it not before October, 1900.

A very large quantity of rolling stock, 60 engines and the equivalent of 3,600 short trucks, was ordered in August, 1901, making a large increase to the stock in South Africa before the war in order to meet future developments.

#### NEW ROLLING STOCK ORDERED AND BROUGHT INTO TRAFFIC TO DATES GIVEN

	Engines.	Coaches.	Bogie Trucks.	Short Trucks.	Coal Trucks.
Cape Government Railways up to March, 1901 .. .. .	86	Nil	263	1,219	Nil
Natal Government Railways .. ..	Nil	Nil	Nil	Nil	Nil
Imperial Military Railways up to June, 1901 .. .. .	26	Nil	132	10	7
Total .. .. .	112	Nil	395	1,229	7

The Imperial Military Railway Rolling Stock was erected by the Cape Government Railway at Salt River, Uitenhage, and East London. This was,

of course, an economical arrangement, as the trucks, when erected, brought up supplies instead of being themselves carried up in pieces in other trucks, and erected at Pretoria. The Natal Government Railway also erected some engines for the Imperial Military Railway.

#### (4) SUMMARY OF WORK OF THE LOCOMOTIVE DEPARTMENT.

While the Locomotive Department in the Orange River Colony had not been very much affected by the war and could be fairly easily restarted, in the Transvaal the Department had to be entirely re-created. District Locomotive Superintendents and their staffs had to be appointed and organised in their districts. The workshops had to be restarted at once, at full pressure, in order to cope with the vast amount of damaged rolling stock. Temporary and hasty arrangements had to be improvised to carry on the running, and replaced, as soon as possible, by regular organisation. The water supply had to be reconstructed at almost every place, necessitating new pumps, tanks and engines. The mere fact of having to work with an entirely new and unknown staff down to the lowest, was productive of numberless difficulties, while the action of the enemy in frequently wrecking trains added enormously to the difficulties.

The behaviour of the engine drivers and firemen, under peculiarly dangerous and trying circumstances, was most gallant. The number of occasions on which trains were wrecked by the enemy were numerous, and the casualties among these men were considerable; nevertheless, only on very few occasions did they refuse to run by day, and then generally for excellent reasons; and when urgent troop moves necessitated night running they always responded to the call. The danger of engine driving was considerably increased when the enemy took to laying mines which were exploded automatically by the engine.

#### (5) *Conclusions.*

The importance of rapidly repairing damaged water supply cannot be over estimated. The Locomotive Department should send a small party with the construction train to make temporary arrangements, and should simultaneously commence, without any delay, the installation of new steam pumps and the erection of wooden tanks until new iron tanks can be provided.

The rolling stock in use on the Cape and Orange Free State Railways was eminently suitable for military purposes. The long flat bogies were invaluable for wagons and guns, and the sheep trucks were easily converted into cattle trucks to augment the number available. The Transvaal rolling stock, although better from the point of view of tare, was not so suitable for military purposes. Large orders for new rolling stock should be given immediately on the outbreak of a war, if there is any likelihood of the enemy removing existing stock, or, if the total of stock available on the enemy's lines is considered insufficient by the Director of Railways.

#### (IVE.)—IMPERIAL MILITARY RAILWAYS—TRAFFIC DEPARTMENT.

##### (1) *Creation of a Traffic Department.*

The Traffic Manager of the Orange Free State Railways retired northwards with the retreating enemy. It was therefore necessary to appoint a Traffic Manager of the Imperial Military Railways. The Director decided that in this department, as in the Accounts branch, it was absolutely essential to have a civilian thoroughly conversant with the system of traffic working customary in South Africa. He accordingly obtained the consent of the General Manager of the Cape Government Railways to appoint Mr. W. Hoy, hitherto Assistant Traffic Manager on the Cape Midland Line. The bulk of the traffic employes were at their posts, while those who had left the country on the outbreak of war were, as speedily as possible, reinstated.

There were still, however, a great many vacancies to fill, and the same means were adopted as in other departments, viz., by employing soldiers with railway experience. The traffic system adopted was that already in force on the Cape and Orange Free State Lines.

(2) *Temporary Traffic arrangements following up the Army.*

As the line of railway fell into our hands, the Traffic department had to make immediate arrangements for reopening and restarting stations, and for the running of traffic under abnormal conditions with a minimum of rolling stock and a maximum demand upon it, while unforeseen calls at unforeseen points made regular traffic working impossible for some time, thereby entailing hard work and long hours on all concerned. The moment the line was opened to Bloemfontein the scarcity of rolling stock caused a serious strain.

Immediately after the outbreak of war and the investment of Kimberley, Mafeking, and Ladysmith, the enemy succeeded in having the advantage of a balance of rolling stock on their side amounting to 58 engines, 1,852 trucks and 131 coaches, and the rolling stock captured in Bloemfontein (28 engines and 325 trucks, many of which required repair) was not proportionate to the increased length of line which it was now necessary to work.

The Commander-in-Chief was exceedingly anxious to make a dépôt for supplies at Bloemfontein, whilst several thousand additional troops, with their animals, and, what was still worse, a large quantity of transport, were being hurried forward to Bloemfontein.

While this was being carried out the Director began to make preparations for an advance north into the Transvaal and also from Kimberley to Mafeking on the western line.

The question of Field railway sections was now reconsidered. The experience gained in working them on the western and midland lines, had shown that there was no necessity for the Traffic and Locomotive Departments of the Field sections, and that they did not require an Assistant Director at their head.

The arrangement of a "Junction station" between the Traffic departments of the line of communication and the Field Sections, and the working of short sections of line at the front under a separate system, had proved to be absolutely impracticable, and had led to confusion, notably between Orange River and Kimberley. It had been thought that civilian traffic officials might object to go to railhead, but it was found that this difficulty never arose.

It was decided that in future for the advance northwards, construction trains, under officers of the Works Department, would carry out repairs. It was arranged that the Traffic staff of the Imperial Military Railways in the Free State and of the Cape Government Railways on the western line should work the traffic up to railhead, where there would be a junior traffic officer or official, who would take orders from the officer in charge of the construction trains with regard to the traffic between railhead and the last station, precedence being given to railway material. It was also decided that a Deputy Assistant Director should accompany the General in Command of the force advancing along the line, in order to keep the railway officials informed of the General's wishes with reference to troops and stores to be forwarded by rail, and also to send back reports indicating where additional Traffic staff would be required, and to make arrangements for utilising any railway employes that might be found. These arrangements were found to work admirably.

The western Field railway section was still at Kimberley, and was to form the construction train for the advance on the line to Mafeking, all traffic and locomotive men from this section being sent to Bloemfontein to work on the Imperial Military Railways.

Owing to the abolition of field sections, Major Twiss, R.E., hitherto Assistant Director, Midland Field section, was appointed Chief Staff Officer

to the Director, and assisted to organise the newly formed Imperial Military Railways.

The difficulty under which traffic works in time of war, especially during the rapid advance, has already been referred to in Section IV A (2).

### (3) *Resumption of Traffic on the Transvaal Railways.*

The Traffic Department, like others, moved its headquarters to Johannesburg on the capture of that place, and like them also it had to face immediately the difficulty of restarting the Transvaal lines. A great many men were of necessity employed in positions for which they were not fitted.

1,130 miles of railway were captured from the enemy and had to be provided with traffic officials. These were collected from all quarters, they had been trained on different systems, and their qualifications were as yet unknown.

The Cape Government Railways' administration, as usual, rendered great assistance in supplying men. The following list shows in approximate detail the Traffic Staff of the Imperial Military Railways, and how it was provided :—

Number provided by Railway Companies, Royal Engineers ..	16
Number provided by men taken from the Army .. ..	374
Found in the Free State and reappointed .. ..	48
Railway refugees from the Free State reinstated .. ..	49
Found in the Transvaal and reappointed .. ..	59
Railway refugees from the Transvaal reinstated .. ..	12
Transferred from Cape Railways and replaced by men from England .. .. .	170
Transferred from Natal Railways and replaced by men from England .. .. .	44
Received direct from England .. .. .	117
Obtained elsewhere .. .. .	167
<b>Total number required .. .. .</b>	<b>1,056</b>

There were also 523 natives in the Traffic department in September, 1900.

The irregularity in traffic working, an outcome of the exceptional circumstances, bore hardly on the traffic officials.

As the length of line in our control rapidly extended the scarcity of rolling stock became more and more felt, and it was with the greatest difficulty that the urgent demands of the Army were met.

This strain continued until the recapture at the extremity of the eastern line of 199 engines and 2,645 trucks, which the enemy had stowed away down the Selati and Barberton branches. Several engines and over 500 trucks had been burnt or blown up, but the remainder were intact and were immediately brought into use.

The rolling stock tables, already given on page 55, show the amount ordered in anticipation of great damage being done by the enemy, but though the orders were placed early in the campaign, it was not until September and October, 1900, that the new rolling stock began to run.

Another circumstance that served to limit the carrying capacity of the railway was the impossibility of running night traffic owing to the repeated attacks on the line by the enemy. Military posts were placed to guard bridges of 30 feet span and upwards, so that only culverts and permanent way could be damaged, and that only during the night. These small breaks did not seriously interfere with traffic as they could soon be repaired, but by stopping night traffic they curtailed the capacity of the railway. Later, when the bridge guards were supplemented by intermediate block houses, traffic became comparatively safe, and night running was gradually resumed on different sections of the line.

The tables of rolling stock, already given on pages 53–55, will explain what difficulties the Traffic department had to contend with.

An important point to be noted was the existence of the collieries in the northern part of the South African Railway system, viz., at Vereeniging, Middelberg, Boksburg, Brakpan, Witbank, Belfast and at Newcastle. This was naturally of the very greatest advantage, since the coal to be distributed on the railway system was carried in trucks which would otherwise have been returning empty to the coast. Had the position been reversed, and the collieries all existed in the south, it would, of course, have reduced appreciably the number of trucks available to carry supplies and stores to the front.

(4) *Summary of Work of the Traffic department.*

The traffic carried on the Imperial Military Railways between March 31st, 1900, and December 31st, 1901, was as follows :—

Goods..	..	..	..	..	621,673 tons.
Passengers	..	..	..	..	935,817
Truck loads of live stock and vehicles					31,579

The following table shows the numbers of troops and quantity of military stores landed and entrained at the ports of Cape Town, Port Elizabeth, East London, Durban and Delagoa Bay :—

TABLE SHOWING MILITARY TRAFFIC FROM THE PORTS.

Period.	Port.	Military Passengers.	Animals.	Guns.	Wagons. Truck Loads.	Stores. Tons.	Supplies. Tons.	Various. Trucks.
From October, 1899, to June, 1901..	Cape Town ..	211,394	73,268	372	1,703	35,910	111,231	--
" " ..	Port Elizabeth ..	47,496	64,789	9	1,276	21,842	210,015	--
" " ..	East London ..	41,406	55,299	65	1,196	11,581	173,210	--
Total in 21 months from Cape Colony Ports		300,296	193,356	446	4,075	69,333	494,456	--
From September, 1899, to June, 1901 ..	Durban ..	92,495	76,423	166	699	323	982	--
From January, 1901, to June, 1901..	Delagoa Bay ..	..	..	..	..	Civil. 80 Military. 1,399	Civil. 2,002 Military. 31,923	--
From November, 1899, to June, 1901 ..	Intermediate Traffic (originating at Stations in Cape Colony other than Ports)	941,764	346,965	..	..	Supplies and Stores, mixed total in tons, 389,066	10,494	



## (5) EXPERIENCE GAINED.

There is no doubt that it is impossible to improvise traffic employés from men who have had no experience. It is absolutely necessary to obtain men who have had a thorough training, if possible, in single line working, and as far as possible the systems in vogue in the country should be adhered to in order to establish order out of chaos as soon as possible. The South African Campaign has fully shown the necessity of having a number of traffic employés registered in peace time, who are paid a small retaining fee, which will render them liable to be called out in case of war at home or abroad. The want of this system forced the Director of Railways in South Africa to employ a large number of men who had been employed by the enemy, and who could not be relied on, and also to withdraw from the fighting line a large number of soldiers with railway experience prior to enlistment, and he was compelled to work the railways with this heterogeneous mass of individuals whose qualifications were unknown; and the amount of correspondence and work it entailed over the questions of conditions of service, pay, transfer, &c., of all these men coming from different parts of South Africa, and from different units, was tremendous. The registration system would also arrange for the men on the railways being subject to Military Law, the necessity for which has been clearly proved.

Another matter which is now beyond doubt, is the fact that traffic cannot be expected to run to a time-table during war, until something like order has been established.

The formation of the Field Railway Sections to work the traffic of the section of line nearest the front was started under the supposition that civilian traffic officials might object to going near the front; but it was found that no instance of this occurred, consequently there was no necessity for Field Railway Sections to work traffic, in fact it was absolutely impracticable, and was abolished.

Experience has shown us the proper organisation during advances, viz., "Construction trains," the officer in command of which controls traffic *only* between railhead and the last station, while a Deputy Assistant Director of Railways and a Works Officer accompany the advancing force. It is also of paramount importance to remove all rolling stock should a retirement be necessary. The railway department in South Africa was much hampered by this action on the part of the enemy.

An important point that has to be considered, is the method of working train crossings in future campaigns. Naturally, the system in vogue in a friendly country would be adopted, and we may assume that if this friendly country has been evacuated temporarily, the staff will be available to reoccupy it; but when taking over the enemy's railway and providing an entirely new staff, we may be faced with the impossibility of providing men who are capable of telegraphing the train crossing messages. Experience in South Africa has shown that it is impracticable within a certain distance of an advancing railhead, when traffic is disorganised, to work on the old-fashioned staff and ticket system. If electric block instruments existed, they would probably be found destroyed, and time will be required to put them right. If none existed previously, then special block wires must be run by the telegraph department, which is already strained to its utmost in restarting, without a day's delay, telegraph communication with the Army, so that for some time we may expect to find no wires provided for electric block working. On the other hand, it has been found that the system of working by telegraph, station to station messages, adapts itself admirably to the disorganised state of traffic. The conclusion therefore arrived at is, that such staff as is capable of working trains on telegraph messages should be placed on the section of line nearest to railhead, and a certain number of men qualified in this manner must be provided. Where they do not exist, electric block instruments must be installed, and for this purpose, on a single line, Tyer's Tablet Permissive, No. 5, is strongly recommended. Probably it will be necessary to fit up the instruments for crossing at intermediate sidings where no staff exists. In this manner a railway, when taken over, can be operated at once, while the party running wires for, and installing block instruments, follow up with all possible

speed, connecting those stations from which the telegraph staff is taken, to go further ahead.

This difficulty never arose in South Africa, because it is one of the regulations of the Cape and Orange Free State Railways that station-masters and foremen must be acquainted with telegraphy; consequently, a sufficient number of men could be found to fill the posts. In any future campaign, it will be as well to utilise men capable of operating telegraph instruments as much as possible, and only to revert to electric block instruments as a last resort.

#### (IVf.)—IMPERIAL MILITARY RAILWAYS—TELEGRAPH DEPARTMENT.

##### (1) CREATION AND NECESSITY FOR RAILWAY TELEGRAPHS.

The proper relations between the Army and railway telegraphs, as laid down in the "Manual of Military Telegraphs," were found to require revision at a very early stage of the campaign. In these regulations it is assumed that train crossings will be worked by electric block instruments, and, therefore, that the telegraph clerks and instruments required for the railway will be few. It is also assumed that one wire will be sufficient. In South Africa it was necessary to adopt the system in force, and, as no electric block instruments existed, it would have been impossible to instal them with sufficient rapidity to keep pace with the advance of the Army, while the fact that the staff was entirely unacquainted with them, would have rendered their wholesale adoption a dangerous measure; consequently, telegraph instruments were required for every station, where, as in most cases, they had been destroyed by the enemy.

Again, the assumption that one wire is sufficient for the railway, has been proved to be wrong. The minimum required by the railway is two wires, and, on a busy main line, three, though, for a short time during the taking over of the railway behind an advancing Army, the railway must be content to work temporarily with one, provided that the second wire is put up as soon as possible, followed later, if necessary, by a third. If block instruments are installed, an additional wire would be required; and if these instruments are provided for crossing at intermediate sidings, then yet another wire must be provided.

On arrival at Bloemfontein, both the Director of Railways and the Director of Army Telegraphs had discovered that the previous ideas concerning railway telegraphs were erroneous, and a discussion took place as to what should be the future arrangement, with the result that the Director of Railways undertook to provide and work his own railway telegraphs as a separate department.

He appointed Lieut. M. G. Manifold, R.E., to be Superintendent of Railway Telegraphs. The Orange River Colony already possessed their own railway telegraph system, and the Controller, who was at his post, was reappointed under Lieut. Manifold.

##### (2) WORK OF THE TELEGRAPH DEPARTMENT.

The Superintendent of Railway Telegraphs had, therefore, to face the difficult task of improvising a department, obtaining employes for offices and for the maintenance of over 1,100 miles of line of several wires, providing, at short notice, material for the repair and maintenance of these lines, also providing instruments, batteries, &c., for the nineteen offices which had been wrecked by the enemy. The permanent reconstruction of over twenty miles of line totally destroyed by the enemy, spread over a considerable length, besides numerous small breaks, and the improvement of all the lines by the provision of stays, had also to be carried out. The frequent breaks due to the enemy's action also gave plenty of work to the Department, though these breaks were often repaired by the Army Telegraphs. The electric lighting of

railway premises at Bloemfontein, Johannesburg, Elandsfontein, and Pretoria, as well as the driving of some of the machinery, was also taken over, increased and maintained by this department.

#### (IVG.)—IMPERIAL MILITARY RAILWAYS STORES DEPARTMENT.

On arrival at Bloemfontein, the Chief Storekeeper of the Orange Free State Railways handed over to Quartermaster and Hon. Lieutenant A. N. Tucker, R.E. This officer had been engaged in the Cape Colony in keeping the Royal Engineers construction parties supplied with material. He had also formed an office for dealing with all the Director's requisitions from England.

He now appointed a representative at Cape Town and proceeded to take over the staff of the Orange Free State Stores Department, nearly all of whom were at their posts. The Works Department immediately called upon him to provide a large quantity of stores for reconstruction of the railways when the advance continued. All these demands were promptly met.

On the capture of the Transvaal Railways, the Stores Department likewise moved its headquarters to the Transvaal, where it had to face the same difficulties as the other departments in providing an entirely new staff, and taking over a vast quantity of stores with the least possible delay.

#### (IVH.)—IMPERIAL MILITARY RAILWAYS ACCOUNTS DEPARTMENT.

The Chief Accountant of the Orange Free State Railways did not remain in Bloemfontein, but retreated north with the enemy, but practically the whole of his staff remained at Bloemfontein. Mr. C. W. Elkington, the next in seniority, who had left the Orange Free State before the outbreak of war, was accordingly appointed Chief Accountant, and the system in force was naturally continued. It was fortunate that the staff of trained railway accountants were thus available, as this department would probably be the hardest one for the railway to improvise, and it is also one of the most important.

The headquarters of the department of course moved to Johannesburg when the railways established their headquarters there, and the department was, like others, immediately augmented to meet the increase of work.

#### (IVK.)—MINOR DEPARTMENTS, IMPERIAL MILITARY RAILWAYS.

##### (1) RAILWAY MEDICAL DEPARTMENT.

Dr. Croghan was appointed principal Medical Officer for the Imperial Military Railways. District officers and hospitals were established where necessary, with the staff required. The department was administered on the lines previously in force in the Orange River Colony, and gave entire satisfaction to all concerned.

##### (2) RAILWAY STAFF DEPÔT.

Reference has already been made to the creation of this department, which proved eminently successful and a most necessary measure. The need for this office has been fully proved. Questions arose concerning almost every military railway employé on the railway, and these were dealt with by the officer commanding railway staff depôt, in accordance with the Army regulations and the decisions of the Adjutant-General.

##### (3) EMPLOYMENT OFFICE, CAPE TOWN.

A somewhat similar institution to the railway staff depôt was formed at Cape Town, to deal with civilian employées applying for situations on the

Imperial Military Railways. To this office all applications were referred, and the heads of departments applied when in need of any class of civilian employés.

Mr. Secretan, of the Pietersburg Railway, took charge of this work.

#### (4) FORMATION OF A FORCE OF RAILWAY POLICE.

It was soon found that most extensive thefts were being carried out on the line, and the matter reached such a pitch that it was necessary to take in hand the organisation of railway police. Captain C. J. Lloyd Carson was appointed Commissioner of Railway Police.

When first formed, this corps was not under the control of the Director. This was found to be a mistake, and it was altered. The result of Captain Lloyd Carson's organisation of the railway police was an immediate decrease in the amount of looting on the line, and the improvement was steadily maintained.

#### (5) APPOINTMENT OF ASSISTANT DIRECTOR OF RAILWAYS, LORENÇO MARQUES.

Traffic having been re-opened with Lorenzo Marques, in Portuguese territory, in October, 1900, it was found necessary to appoint an Assistant Director of Railways. Lieutenant (local Major) R. B. D. Blakeney, D.S.O., R.E., formerly Assistant Traffic Manager, Egyptian State Railways, was therefore sent to Delagoa Bay in this capacity. He was thus able to collect a considerable quantity of information with reference to the Netherlands Railway, and also facilitated the forwarding of stores by rail for the Army from Delagoa Bay, acting as agent of the Imperial Military Railways with the Portuguese officials. Captain Hely, of the Imperial Yeomanry, an officer who had considerable railway experience, subsequently took over the work from Major Blakeney.

### V.—THE ORGANISATION AND USE OF ARMoured TRAINS.

It was some time before the proper functions of armoured trains were understood, either by the Army or the Railway Department. At the commencement of the war five armoured trains had been constructed in the locomotive shops at Cape Town on the advice of Major Stewart, R.E., and five had been constructed in Natal. Two Natal trains were shut up in Ladysmith, the other proceeded to railhead, Natal, and those in the Cape were disposed as follows:—one at railhead, on the Eastern line, one at railhead, on the De Aar-Kimberley line; another, just prior to the outbreak of war, had been sent to Kimberley to proceed to Mafeking, but, on the first night of the war, this train had been wrecked and destroyed by the Boers at Kraaipan, one was in Kimberley, and one in Mafeking.

The armoured trains led a precarious existence for some time, being constantly sent scouting for many miles up the railway without any support, with the natural result that one of the Natal armoured trains was destroyed by the enemy on the 15th November, 1899, outside Chieveley. The trains in the Cape Colony were more fortunate, and had several lucky escapes. Owing to these incidents, the impression that armoured trains were useless became general. At this stage of the war, used as they were without support ahead of the advance, exposed to the artillery of the enemy, armed only with Maxims and rifles, they certainly were useless, but, when later we had all the lines in our possession, with fortified posts every few miles along the railway, and the enemy's artillery had become scarce, the armoured trains,

which now carried guns, were invaluable for protecting the line, and frequently succeeded in damaging the enemy. There is no doubt also that the enemy disliked them intensely, and the presence of an armoured train had a great moral effect.

The number of armoured trains was gradually increased to a total of 19, and they were at first placed entirely under the orders of officers commanding sections on the line. This was found to be unsatisfactory. Armoured trains were constantly rushing out, against orders of the Traffic department, sometimes without a "Line Clear" message, and thus caused serious delays to traffic. In fact, instead of assisting traffic by preventing the enemy from interrupting it, they caused more interruptions than the enemy themselves. Also it was found that the usefulness of armoured trains was greatly enhanced if they could be moved to that part of the railway system which was most threatened. Some armoured trains had remained inactive in some particular station, while an adjacent district was being constantly harried by the enemy in their absence.

Officers commanding sections of the line often were known to use the armoured train to convey them to inspect their posts between stations, thus blocking traffic while they were inspecting.

For these reasons Captain H. C. Nanton, R.E., was appointed Assistant Director for armoured trains, with the local rank of Major, and as such was on the staff both of the Commander-in-Chief and of the Director. All armoured trains in South Africa were placed under his direction.

Captain H. C. Nanton, R.E., had acted as Deputy Assistant Director of Railways at Kimberley until May, 1900, and then as Deputy Assistant Director at Kroonstad for several months, after which he had commanded an armoured train, with which he had rendered excellent service, frequently inflicting severe loss on the enemy—notably at Baartman Siding, when he succeeded in capturing nearly the whole of Commandant De Wet's ammunition and supplies. He was, therefore, acquainted both with the requirements and regulations of the railway and also with the handling of the armoured trains. Being in touch with headquarters, he was kept informed as to which portions of the railway system were most threatened by the enemy, and he then ordered armoured trains to move to those portions. Since the enemy's dispositions were constantly changing, it was necessary to keep altering the distribution of the armoured trains, to see that all were equipped and armed in the best possible manner, and to experiment with different designs and cause those which proved useful to be adopted. It was also his duty to instruct officers in command of armoured trains as to the proper tactics to adopt, best methods of patrolling, &c., to see that they worked in harmony with the railway officials, and were an assistance and not a hindrance to traffic. Armoured trains were under the orders of generals or other officers commanding the section of line to which the train was detailed by the Assistant Director as long as it was on that particular section, and it was the duty of the Officer Commanding the trains to be in touch with the General's Staff Officer so as to gain early information of the enemy's movements; but at the same time the armoured train could be removed by the Assistant Director as soon as he thought it was more urgently required elsewhere. Generals and officers commanding sections of the line could not use the train as a private conveyance, nor alter its garrison or equipment, nor give orders to the officer commanding which were contrary to the spirit of the general instructions laid down by the Assistant Director. It was the duty of the latter to work in harmony with officers commanding sections of the line, and while leaving the trains in their control, at the same time to draw the Commander-in-Chief's attention to cases where they were not being used in the manner which general experience had proved to be the best.

When the Army was checked at Magersfontein and remained entrenched there for some weeks, the Director drew the attention of the Officer Commanding Royal Artillery to the possibilities of mounting 6-inch breech-loading guns on railway trucks and firing them from the railway track.

A 6-inch gun was accordingly mounted on a truck by Mr. Beatty, Locomotive Superintendent, Cape Government Railways, and gave excellent results. It was found that it could be fired at an angle of 20 degrees off the direction of the track without any mishap, and probably it could be fired

at a greater angle still; also the recoil of the truck was very slight—only three or four feet. By laying down two curved lengths of track, one on each side of the line, the gun could cover an arc of 180 degrees or more without any special packing up, while by packing up with sleepers under a projecting girder, so as to increase the base, it was found that the gun could be fired at right angles to the railway without any mishap to the gun or to the permanent way.

This gun was sent up to Modder River, and arrived just in time to shell the Magersfontein trenches the day before the Boers evacuated them. It again did excellent service near Fourteen Streams when, in conjunction with observers in a balloon, it dropped shells at 11,000 yards into successive Boer laagers, much to their surprise.

Later on in the war a 9·2-inch gun was run up to Pretoria, mounted on a truck, and also gave good results in its trials. This gun unfortunately never succeeded in getting an opportunity to fire on the enemy.

These experiments had, however, demonstrated the possibility of big guns being used in siege operations without any difficulty, the only limit to the size of the gun being the weight which the railway bridges will stand.

This point is also worthy of consideration in connection with Coast Fortifications in England.

## VI.—ORGANISATION OF ARMY LABOUR DEPÔT.

One of the first things taken in hand by the Director was the provision of native labour. It was evident that a large amount of unskilled labour, preferably native, would be required to repair the railway, and also for the Army Service Corps, Ordnance Store Corps, and field units of the Royal Engineers.

It was most desirable that the different departments should not compete with each other, but that all natives employed by the Army should be paid on the same scale, and be subject to the same regulations. As the Director of Railways would be the largest employer of native labour he received the Commander-in-Chief's permission to organise the Army Labour Depôt, on which all requisitions were to be made. Mr. Scott, an officer of the Cape Colony Military Forces, and of the Cape Government Civil Service, who was well acquainted with the natives in South Africa, was appointed Officer Commanding the labour depôt, with the rank of Captain. Mr. Cowie and Mr. Reynolds were appointed to assist Captain Scott, with the rank of Lieutenant. They established their headquarters at De Aar, and immediately commenced to engage 1,000 natives as a start. Later on in the war they moved their headquarters to Bloemfontein, and later still established a branch at Johannesburg. This institution proved a most necessary and useful one, and the demand for native labour became so great that the establishment of the Army Labour Depôt was increased, first to 2,000, then to 3,000 and afterwards to about 20,000 natives.

An Army Labour Depôt, composed of the labour, whether white or black, of the country in which any future campaign may be carried out, will probably always be found indispensable.

## VII.—MISCELLANEOUS.

The railway troops and working parties were frequently engaged with the enemy. At Belmont the repair of the line proceeded while the battle was in progress, and the station was reached immediately after the enemy had been defeated. At Graspan the Royal Engineers construction party acted as escort to the naval guns, and assisted in dragging them into action and keeping up the supply of ammunition. At Modder River the result seemed so uncertain that the 250 to 300 Royal Engineers on railway reconstruction were sent into the firing line, the senior Royal Engineer officer having sent a message to the General reminding him that his men were available for reinforcements, if required. At Magersfontein the armoured train ran right up to the left of the enemy's position, but was unable to engage the enemy. At Zand River the enemy attacked the railway pioneers engaged in bridge construction, but were driven off with heavy loss. At Leeuwspruit a night attack on the construction trains was repulsed, while at Zuikerbosch an attack in force on the railhead party was also defeated. Small construction parties frequently came into contact with the enemy, and the armoured trains engaged them on numerous occasions with great success.

The Director of Railways was, of course, not responsible for the defence of the line, but a few passing remarks on this subject should be made.

The railway officers were responsible for keeping the general officers on lines of communication informed as to the most vulnerable points of the railways, bridges, water supply, collieries, &c., and it was found necessary to place entrenched posts at every bridge exceeding 30 feet span, while constant patrolling was maintained between posts. In 1901, when nearly all the enemy's artillery had been captured, an excellent system was adopted of placing blockhouses at an average distance apart of 2,000 yards. Each blockhouse was garrisoned by about ten men, and was surrounded by wire entanglement. Another very effective measure was the provision, as far as possible, of one armoured truck in every train, and in this an escort travelled. Armour plates were also hung on the sides of the engine driver's cab, while in order that the effect of a mine might be minimised, the first train in the morning had two or three trucks in front of the engine.

Many schemes were suggested for minimising the danger to trains from the enemy's action, but the majority were more ingenious than practicable. One plan suggested by an inventor in England was to run a heavy electric motor some distance from the engine, worked from the locomotive, to which it would be connected with electric leads; the practical difficulties, however, were first to keep the wires between motor and train taut over a distance of at least 300 yards, which would be the minimum interval of any use; secondly, to prevent the wires fouling trees, telegraph poles, blockhouses, &c., round sharp curves, and also the difficulties at stations. Again, when the enemy took to using observation mines, instead of contact mines, this costly and elaborate arrangement would be useless.

The blockhouse system was a practical solution which answered admirably, as is demonstrated by the fact that in the month of October, 1901, not a single accident was caused by the enemy on any portion of the railway system of South Africa.

It was improved by the addition of obstacles, wire entanglements, &c., between blockhouses, and various forms of alarm fence to warn the garrisons of the presence of the enemy.

The diagrams attached to Appendix D show the manner in which the destruction of railways gradually ceased as the blockhouse system was extended.

## APPENDIX A.

**TABLE SHOWING THE DISTANCES OF THE PRINCIPAL MILITARY STATIONS USED DURING THE OPERATIONS FROM THE BASE PORTS.**

Stations.	From Cape Town.	From Port Elizabeth.	From East London.	From Durban.	From Delagoa Bay.
	Miles.	Miles.	Miles.	Miles.	Miles.
De Aar .. ..	500	339	440	—	—
Orange River .. ..	570	409	470	—	—
Modder River .. ..	623	462	523	—	—
Kimberley .. ..	647	485	547	—	—
Mafeking .. ..	870	709	770	—	—
Bulawayo .. ..	1,361	1,199	1,260	—	—
Naauwpoort .. ..	570	270	331	—	—
Norval's Pont .. ..	628	328	389	—	—
Stormberg .. ..	679	326	221	—	—
Bethulie.. ..	686	386	289	—	—
Springfontein .. ..	662	362	314	—	—
Bloemfontein .. ..	750	450	402	713	640
Kroonstad .. ..	878	578	529	585	512
Vaal River .. ..	962	662	613	500	427
Elandsfontein .. ..	1,004	704	656	474	386
Johannesburg .. ..	1,013	713	665	485	396
Klerksdorp .. ..	1,131	831	782	601	512
Pretoria.. ..	1,041	741	692	511	349
Pietersburg .. ..	1,219	919	870	689	527
Middelburg .. ..	1,136	836	787	606	254
Belfast .. ..	1,177	877	828	647	213
Barberton .. ..	1,324	1,024	975	794	136
Komati Poort .. ..	1,332	1,032	983	802	58
Standerton .. ..	1,094	794	745	369	491
Volksrust .. ..	1,155	855	806	308	552



## APPENDIX B.

### SOME EXTRACTS FROM ARMY ORDERS AFFECTING RAILWAY WORKING.

#### 1.

*Lines of Communication Orders—Cape Town, 6th December, 1899.*

##### 564. RAILWAYS—ROLLING STOCK.

Owing to the great strain put on the rolling stock in forwarding troops and supplies, it is imperatively necessary that all trucks should be unloaded immediately they reach their destination, so as to be able to carry further supplies to the front.

The extreme importance of this is impressed on all Station Commandants, and they should understand that arrangements must be made to avoid any congestion of loaded trucks in their stations.

In the case of Station Commandants being required to keep a supply of trucks ready loaded with stores, for the use of troops advanced beyond their depôts, they should require the written authority of the General Officer Commanding such forces before giving their sanction to the trucks remaining under load.

#### 2.

*Lines of Communication Orders—Cape Town, 22nd December, 1899.*

##### 652. STORES.

The Cape Government Railways have been requested not to issue stores for military consumption, except through the Director of Railways, or Officers of his Staff, to whom all requisitions should be sent.

Officers forwarding such requisitions are to satisfy the Director of Railways, or the Officer representing him, that the Chief Ordnance Officer, or the Officer Commanding Army Service Corps, as the case may be, is not in a position to supply the stores at the time they will be required.

#### 3

*Lines of Communication Orders—Cape Town.*

##### 2. DUTIES OF COMMANDING ROYAL ENGINEER ON LINES OF COMMUNICATION.

(a) The Commanding Royal Engineer Lines of Communication will be responsible to the General Officer Commanding Lines of Communication for the efficient and economical execution of all Engineer Services on the Lines of Communication, *except those under the charge of the Director of Railways and Director of Telegraphs.*

#### 4.

*Lines of Communication Orders—Cape Town, 1st March, 1900.*

##### 2. RAILWAY STATIONS, LOITERING ON.

Strict orders should be given by all Commandants of Stations on the Lines of Communications that all unauthorised persons, soldiers or civilians, other than the Railway Staff, are to be excluded the platforms of railway stations during the time troop trains are stopping at the station.

## 5.

*Lines of Communication Orders—Cape Town, 30th April, 1900.*

## 1. COAL.

The following procedure will be observed by all officers who may find it necessary to draw coal from the various railway stations and depôts on the Cape Government Railway systems:—

- (a) Coal is an Army Service Corps supply, and all indents will be made on the Army Service Corps Officer in charge of supplies for the particular station where the coal is required. The General Manager of the Cape Government Railways has been requested to instruct his Storekeepers not to issue any coal unless requisitioned by the Army Service Corps Officer in question.
- (b) Army Service Corps Officers will requisition monthly, in advance, on the Director of Railways, Cape Town, stating the probable amount of coal to be drawn at each station, and the Director of Railways will furnish the Railway Storekeeper with the necessary authority to issue. For unforeseen issues, telegrams may be submitted for requisitions.
- (c) After approval has been obtained, coal will be issued by Storekeepers, but only on written or telegraphic order of Army Service Corps Officers in charge of supplies and to the corps or individual (whose receipt will be obtained by the Storekeeper) designated in such order.
- (d) Periodically the account of the Cape Government Railway for the coal supplied will be forwarded through the Director of Railways to the Army Service Corps Officer concerned for payment in the usual way.

## 6.

*Army Orders—Cape Town, 3rd November, 1899.*

## 285. RAIL CONVEYANCE FOR TROOPS AND STORES.

Commencing on the 1st November, 1899, the system of requisitioning conveyance for troops and stores by rail in Cape Colony will be carried out in accordance with instructions which have been approved, and are issued herewith to all concerned.

Books of Requisitions for Rail Conveyance of Troops and Army Books, 10A (Way Bills for Conveyance of Stores), will be issued in due course to Heads of Departments and Units. Demands for same will be at once put forward by all concerned.

With reference to District Order No. 262, of the 6th October, 1899, the address of the Railway Transport Officer will be "Goods Yard, Railway Station, Cape Town," and not as therein stated.

## 7.

*Lines of Communication Orders—Cape Town, 25th November, 1899.*

## 508. TRAVELLING—CIVILIANS.

The Management, Cape Government Railways, has notified that no civilians will be permitted to travel north of De Aar on the northern line, unless in possession of a permit, signed by the Commandant at De Aar, the Commandant at Orange River, or the Deputy Assistant Adjutant-General (a) Lines of Communication.

Books of passes are issued to all concerned.

Any applications for permits for civilians to travel on military duty at the instance of the Military Departments must be supported by a written order to undertake the journey, signed by a representative of the Department concerned.

## 8.

*Base Orders—Cape Town, 26th November, 1899.*

## 23. MOVEMENTS BY RAIL.

Officers Commanding Units at the Base (Cape Town) will, on receipt of orders for movement by rail, communicate at once, by the quickest method, with—

- (1) The Railway Transport Officer, Goods Shed, Cape Town Station.
- (2) The Officer Commanding Army Service Corps, Cape Town, giving the following particulars with regard to the Unit under orders:—
  - (a) Strength in officers, men and horses.
  - (b) Numbers of carts, guns, &c., stating whether two-wheeled or four-wheeled.
  - (c) Approximate weight of baggage and equipment of Unit.
  - (d) Time at which Unit will be ready to move.
  - (e) Any other information bearing on the movement.

On the receipt of this information the Railway Transport Officer will advise Officers Commanding, giving full particulars of time and place of entrainment, and how the Unit is to be told off.

The Officer Commanding Army Service Corps, Cape Town, will arrange for train rations for men and horses, and for transport to convey baggage, &c., to place of entrainment.

## 9.

*Lines of Communication Orders—Cape Town, 9th December, 1899.*

## 574. TRAVELLING—HOT MEALS.

With reference to Local General Order No. 2573 (4), of the 21st October, 1899, it is notified that in future Officers Commanding will (except at Cape Town) make arrangements for the provision of hot meals for parties under ten proceeding by rail.

They should wire in advance to the Contractors, and furnish the Officer or Non-commissioned Officer in charge with a written authority for the meal.

Order forms have been printed and distributed. The names of Contractors and stations where hot meals can be obtained are shown thereon.

## 10.

*Lines of Communication Orders—Cape Town, 15th December, 1899.*

## 607. STORES.

It having been brought to notice that regiments and departments send stores to the railway direct without first notifying the Railway Transport Officer, and, in many cases, without way-bills, the railway authorities have received instructions not to accept, in future, any public stores for despatch without the authority of the Railway Transport Officer.

## 11.

*Lines of Communication Orders—Cape Town, 21st December, 1899.*

## 649. TRAVELLING—CIVILIANS.

Further to Lines of Communication Orders, No. 508, of the 25th November, 1899, and No. 579 of the 9th December, 1899, civilians requiring to alight at stations between De Aar and Naauwpoort will be required to be in possession of a permit signed by one of the officers referred to in the first-named order, viz., the Commandant at Orange River, the Commandant at De Aar, or the Deputy Assistant Adjutant-General, (a), Lines of Communication.

## 12.

*Lines of Communication Orders—Cape Town, 3rd January, 1900.*

## 4. RAILWAY WARRANTS.

Cases are occurring of troops travelling by rail without having been furnished with warrants. Officers Commanding Units are responsible that all troops under their command requiring rail transport are furnished with proper warrants. These warrants must be presented by the Officer or Non-Commissioned Officer in charge at the booking office, and exchanged for tickets.

Warrants are required for all troop movements over the Cape Government Railways on all sections of the railway which are worked by the Civil Staff.

Railway Staff Officers are responsible for seeing that all troops leaving their stations have presented their warrants at booking offices, and that they are provided with proper tickets. Where no warrants have been issued to troops requiring rail transport, Railway Staff Officers must themselves issue warrants on the authority of Station Commandants.

Station Commandants should indent on the Railway Transport Officer, Cape Town, for the necessary warrant books.

The Civil Railway Staff have been directed to at once bring to the notice of Railway Staff Officers cases of troops travelling without tickets.

## 13.

*Lines of Communication Orders—Cape Town, 6th January, 1900.*

## 7. RAILWAY WARRANTS.

It has been decided to issue to Officers Commanding Detachments or Colonial Corps at stations where there is no Railway Staff Officer or Station Commandant, blank books of railway warrants.

Application for these should be made to the Railway Transport Officer, Goods Yard, Railway Station, Cape Town. Officers should carefully complete forms before issue, and will be held responsible that the warrants are only issued for authorised services.

Attention is directed to Lines of Communication Order, No. 4, of 3rd January, 1900, and District Order of 12th October, 1899.

14.

*Lines of Communication Orders—Cape Town, 8th January, 1900.*

## 4. RAILWAY TRAVELLING.

Officers travelling by rail (except in the case of long journeys by mail trains) may pay their own fares instead of using warrants, subsequently recovering their expenses on Army Form O 1771.

In cases where no Lines of Communication Order or memo. authorising the journey has been issued, this course should be adopted.

15.

*Base Orders—Cape Town, 11th January, 1900.*

## 47. RAILWAY TICKETS.

It is notified for information that, by the railway bye-laws, periodical tickets may be issued only to individuals and not to cover journeys made by several persons alternative to one another. A warrant should be issued for each journey if the same orderly is not always employed.

16.

*Lines of Communication Orders—Cape Town, 27th January, 1900.*

## 5. PERMITS TO TRAVEL BY RAIL.

Station Commandants issuing permits to travel by rail should inform the recipients that these permits do not release them from the obligation of paying their railway fare.

17.

*Lines of Communication Orders—Cape Town, 12th February, 1900.*

## 11. TRAVELLING, RAILWAY WARRANTS.

From this date all warrants for travelling will be obtained from the Railway Staff Officers.

At stations where there is no Railway Staff Officer the warrant will be issued by the Commandant.

An officer or soldier on receiving "an order" to move will take the order in writing to the Railway Staff Officer, who will make the necessary arrangements for the journey.

Officers Commanding receiving orders for small parties to move, will notify the Railway Staff Officer as above.

All warrant books at present in possession of Officers Commanding and Heads of Departments will be returned to the Railway Transport Office, Cape Town, as being no longer necessary.

18.

*Lines of Communication Orders—Cape Town, 3rd March, 1900.*

## 4. RAILWAY TRAVELLING.

Lines of Communication Orders No. 60 (4) of the 1st March, 1900, and 61 (8) of the 2nd March, 1900, are hereby cancelled and the following substituted:—

The Railway Transport Officer will be responsible that the Commandant, De Aar, is informed by wire of the departure of all trains from Cape Town to De Aar and stations beyond, and that the troops carried therein are specified by numbers and corps, and their destination stated. Similar information should also be wired to Officers Commanding stations at which troops are to detain.

Officers and others will not be sent up country by mail trains when troop trains are running, except in cases of urgency, the reason for which must be fully specified on the application for move order. It is the duty of Commanding Officers having details to move, to put themselves in communication with the Railway Transport Officer, and ascertain from him by what train they should go.

## 19.

*Army Orders—Government House, Bloemfontein, 31st March, 1900.*

## 1. IMPERIAL MILITARY RAILWAYS.

(a) No troops or military traffic can travel over the Imperial Railways except under proper authority.

When transport is required, an order authorising the journey must be produced in all cases. This order must distinctly say whether the journey to be performed is on the public service or otherwise.

At stations where Railway Staff Officers are posted the order must be presented to the Railway Staff Officer.

If the order authorises the journey to be performed on the public service, the Railway Staff Officer will issue a warrant, which must be presented at the booking office and exchanged for a ticket.

At stations where no Railway Staff Officer is posted, the order must be presented to the Station Master, who will issue a ticket free, if the order authorises the journey on public service, and on payment if otherwise.

(b) The working of the Imperial Military Railways must not be interfered with, except in cases of great emergency.

In cases of great emergency Officers must give their orders in writing to Railway Staff Officers, or Station Masters at stations where no Railway Staff Officers are posted, but all orders so given will invariably be transmitted through the Director of Railways for the information of the Chief of the Staff, who will judge of the expediency of such orders.

(c) Troops employed on work in connection with the Imperial Military Railways shall be considered as employed on works of a special character, and, in terms of Para. 869 of the Royal Warrant for Pay, 1899, shall receive working pay accordingly.

## 20.

*Lines of Communication Orders—Cape Town, 9th April, 1900.*

## 6. TRAVELLING BY RAIL.

It having been brought to notice that soldiers frequently travel in first-class carriages with third-class tickets, the General Officer Commanding wishes it to be understood that this practice must cease. The Cape Government Railway regulations concede that—"Non-commissioned officers and men will be allowed to travel second with third-class tickets to the extent of the available accommodation on the train, and must, as far as possible, travel together in the same compartment."

These regulations must be strictly adhered to.

*Lines of Communication Orders—Cape Town, 13th April, 1900.*

## 2. RAILWAY PERMITS.

It having been brought to notice that travellers from the Midland and Eastern Systems have in several instances arrived at Orange River without permits, Commandants on these systems are reminded that permits are required for De Aar, Kimberley, and all intermediate stations.

## 22.

*Army Orders—Government House, Bloemfontein, 20th April, 1900.*

## 2. PASSES TO CIVILIANS.

Referring to Army Order No. 6, of the 13th instant, passes are not to be granted by Officers on the lines within the Orange Free State to civilians to proceed to Bloemfontein, except with the permission of the Military Governor, which must be applied for in each case.

## 23.

*Lines of Communication Orders—Cape Town, 24th April, 1900.*

## 10. TRAVELLING WITHOUT TICKETS.

It having become a frequent occurrence of late for Officers and men to travel on the railway without tickets, Officers sending parties by rail are held responsible that they are supplied with the necessary warrant before proceeding. These warrants will be exchanged at the ticket office for the usual tickets.

## 24.

*Lines of Communication Orders—Cape Town, 5th May, 1900.*

## 5. RAILWAY CARRIAGE OF STORES AND SUPPLIES.

(a) Requisitions for trucks required each day at Cape Town for loading Ordnance Stores, Royal Engineer Stores, Railway Stores, &c., should be sent daily to the Transport Officer, if possible by 5 p.m. on the previous day. The requisition should state where the trucks are to be placed for loading, and Officers should be careful not to requisition for more trucks at any place than they can be sure of loading within twenty-four hours from the time they are handed over.

(b) The number of trucks to be allotted daily at Cape Town for supplies will be settled in communication with the Director of Supplies and Transport by the Assistant Director of Railways, who will advise the Railway Transport Officer.

(c) Requisitions made by Officers in Cape Town for trucks at other stations should be sent to the Assistant Director of Railways.

(d) Notice of any considerable movement of supplies or stores, such as the removal of a dépôt, or the despatch of a large number of transport wagons, transport animals, huts, &c., should be given to the Assistant Director of Railways, with an estimate of the total number of trucks required, and of the time in which the movement is required to be completed.

## 25.

*Army Orders—Government House, Bloemfontein, 23rd and 24th March, 1900.*

## 2. RAILWAYS.

From the 17th March inclusive, all railways north of Orange River which have been taken over by the Director of Railways will be designated:—

“IMPERIAL MILITARY RAILWAYS.”

## 26.

*Lines of Communication Orders—Cape Town, 11th April, 1900.*

## 1. EMPLOYMENT ON IMPERIAL MILITARY RAILWAYS.

Officers Commanding Units will forward to this office, as soon as possible after receipt of this order, a list of men from the lines of communication who are desirous of employment with the Imperial Military Railways.

This list should state their qualifications and last employment.

Those men only are required of trades mentioned below, who have previous railway experience:—

*Traffic.*—Stationmasters, guards, brakemen, shunters, pointsmen, checkers, warehousemen, number-takers, porters, lampmen, telegraphists, goods clerks, booking clerks.

*Engineering.*—Carpenters, blacksmiths, bridge-erectors, angle-smiths, platelayers.

*Locomotive.*—Loco. painters, turners, machine hands, riveters, truck examiners, coach and carriage painters, engine drivers, firemen, boiler-makers, coppersmiths, blacksmiths, springsmiths, fitters (erectors), moulders, pattern-makers, tinsmiths, carriage builders.

## 27.

*Lines of Communication Orders—Cape Town, 21st April, 1900.*

## 3. EMPLOYMENT ON IMPERIAL MILITARY RAILWAYS.

With reference to Lines of Communication Orders, No. 101 (1), dated 11th April, 1900, Officers Commanding Units will forward the following information when submitting names:— (1) Age; (2) Date of leaving last employment; (3) Nature of last employment; (4) Married or single; (5) Reservist or otherwise.

Where names have already been submitted, the above information will be given as early as possible. Suitable applicants will most probably be employed after the war, but during the present operations will receive working pay, remaining in the Army.

*Lines of Communication Orders—Cape Town, 1st December, 1899.*

## 533. CIVIL LABOUR.

In order to avoid competition amongst Government Departments, and to facilitate the supply of labour, the Director of Railways has been instructed to form a Labour Dépôt at De Aar.

The following Officers of Departments are authorised to requisition for labour gangs (not less than thirty labourers per gang):—Staff Officers, Supply Department; Staff Officers—Chief Engineer, Assistant Directors of Military Railways, Principal Medical Officer, Royal Army Medical Corps, Army Veterinary Department; Staff Officers—Army Ordnance Department.

Application should be made to Capt. W. S. Scott, Officer Commanding Labour Dépôt, De Aar.

The rates of pay will be as follows:—

Headmen	..	..	..	£5	0	0	per mensem and rations.
Labourers	..	..	..	3	10	0	„ „

Rations will be on the scale laid down in Army Standing Orders for Kaffir and other native employes.

Working hours will be as may be found necessary, Sundays included.

All labourers will be subject to military discipline, but may not be called upon to carry out any military service.

The Officer Commanding Labour Dépôt will arrange for all payments to the men, also for tents and camp equipment.

Rations will be arranged for by the Departments concerned.

Departments will be notified monthly of the expenditure incurred on their behalf.

Departments having already engaged labour should, as opportunity occurs, conform to these rates, and arrange with the Officer Commanding Labour Dépôt to incorporate their labour with his.

*Base Orders—Cape Town, 30th December, 1899.*

## 42. TRANSPORT OFFICES.

A Transport Office will be opened at the South Arm Docks on the 1st January, 1900. All requisitions for transport and labour by Embarking Staff and Ordnance Officers, Docks, will be forwarded to that office on A.F. 756. In the case of transport, stating time required and approximate weight of stores, leaving the Transport Officer to decide on the number of wagons required. In the case of labour, stating number, time, place, and nature of work.

In future the Disembarking Officer will make out all requisitions for transport for units on board ship, and the Dock Transport Officer will deal only with the Disembarking Officer, and never with Officers Commanding Units.

*Director of Railways Orders—Cape Town, 28th January, 1900.*

## 2. NATIVE LABOUR.

Officers employing native labourers from the Dépôt should notify the Officer Commanding Labour Dépôt direct of the transfer of gangs from one officer to another, or from the Director of Railways' Department to any other Department, and *vice versa*.

*Army Orders—Government House, Bloemfontein, 2nd May, 1900.*

## 4. RATIONS.

The following will be added to the Ration Scale published with Army Order No. 4, of 6th November, 1899:—

- (1) (d) *Basutos*.—Headmen: A soldier's ration of meat, breadstuffs, and groceries only. Labourers: Meat, 1 lb. twice a week; biscuit, 2 lbs., or mealie meal, 3 lbs. daily (mealie meal whenever practicable).
- (2) Whenever the exigencies of the service necessitate the issue of rations in the field to civilian employes not entitled to free issues, the following will be the rates to be charged for the same:—2s. 1d. per soldier's ration, 1s. 9d. per ration for white or coloured drivers, 1s. 8d. per ration for Kaffirs and other native employes.

*Army Orders—Government House, Bloemfontein, 10th April, 1900.*

## 1. TELEGRAPHS.

It has been brought to the notice of the Field-Marshal Commanding-in-Chief, that Officers are in the habit of sending unnecessarily verbose telegrams, thereby blocking the wires and causing great delay to the transmission of messages. Many messages that are handed in could equally well be sent by post.

The Field-Marshal Commanding-in-Chief directs that this is to cease forthwith. Only really urgent matter is to be telegraphed and this is to be cut down to as few words as will convey the meaning.

The Director of Telegraphs is hereby instructed to bring to the notice of the Field-Marshal Commanding-in-Chief any telegrams which infringe this order, and should the order not be attended to, Officers generally will be deprived of the privilege of sending unpaid service messages.

The Field-Marshal Commanding-in-Chief also notices with regret that many messages containing purely private matter are improperly franked by Officers, and handed in as service telegrams.

*Lines of Communication Orders—Cape Town, 20th November, 1899.*

## 475. TRAVELLING—ALCOHOLIC LIQUOR NOT TO BE ISSUED TO TROOPS AT RAILWAY STATIONS.

Arrangements have been made with the Railway Authorities that no alcoholic liquor is to be sold from railway refreshment rooms to troops travelling by train, except when absolutely necessary in cases of illness or upon the written authority of the Railway Staff Officer, or, in his absence, of the Officer Commanding Troops.

*Director of Railways Orders—Cape Town, 17th December, 1899.*

## 1. STORES.

The Assistant Directors of Railways have been provided with lists of stores available for purchase in the Colony, and stores available for issue, and should in all cases, as far as possible, requisition for such material as may be required in conformity with sizes shown to be available.

In making requisitions for timber, iron, &c., where dimensions are given, it should be stated what deviations above or below the sections given can be allowed. This course would save a great deal of time in delivery.

Where no such margin of dimensions is given, it is to be understood that the material is to be sent of the exact sizes ordered.

*Lines of Communication Orders—Cape Town, 28th December, 1899.*

## 618. TRAVELLING HORSES.

It having been found by exhaustive experience that horses can travel more safely in Cape Government Railways cattle trucks when loaded loose than when secured by head ropes, it is notified that horses should in future always be so conveyed.

This order does not apply to cattle trucks without roofs.

*Lines of Communication—Cape Town, 7th April, 1900.*

## 5. HORSES—TRAVELLING BY RAIL.

Railway Staff Officers are held responsible that all animals passing up and down country have been properly fed and watered before proceeding upon their journey.



# ADJUTANT-GENERAL'S CIRCULAR MEMORANDUM No. 52.

*Army Headquarters, Pretoria,  
3rd December, 1901.*

## INSTRUCTIONS IN REGARD TO THE WORKING OF THE RAILWAYS.

1. The Director of Railways is alone responsible to the General Officer Commanding-in-Chief for the working of the lines.
2. Commandants are responsible that railway orders are strictly carried out, and that military requirements do not interfere with the regular despatch of trains or working of stations, except in case of emergency, when the Commandant should give his instructions in writing to the Railway Official concerned. Should there be no Railway Staff Officer present, the Commandant should report by wire any action taken to the Deputy Assistant Director of Railways.
3. Railway Staff Officers are appointed to deal with Station Masters and to carry out entraining and detraining of troops and military stores, &c. At important stations such Railway Staff Officers are under the orders of the Director of Railways.
4. The Military and Civil Railway Staff on the Imperial Military Railways are under the sole control of the Director of Railways, and cannot be moved by Commandants except in case of emergency, and for reasons unconnected with the working of the railways. When such cases occur, the Commandants will immediately report the matter to the Deputy Assistant Director of Railways of their section of the line.
5. Commandants will see that all Army Orders, with reference to the railways, are strictly carried out. (Principal orders are annexed.)
6. Particular attention is called to Army Order No. 8, of 24/1/00, directing that railway buildings are not to be occupied by troops.
7. When it is necessary to place station and other railway buildings in a state of defence, care should be taken to see that the efficiency of the Railway Staff is not unduly affected, and the concurrence of the Railway Authorities should be obtained whenever practicable.
8. Railway material should not be utilised for any purpose without the concurrence of the Railway Authorities. This order particularly applies to such material as tarpaulins, fencing, rails, sleepers, &c. All material required for military purposes should be obtained through the Commanding Royal Engineer of the District.
9. Steps should be taken to prevent all unnecessary destruction of railway material. This order particularly applies in the case of columns crossing the railway line.
10. Several cases having occurred of trains coming into contact with unauthorised structures erected at posts between stations, Officers Commanding of such posts are directed to see that no obstruction is thus caused.
11. Posts and blockhouses between stations are not to depend on the train service for their daily rations and water.
12. Commandants and other Officers Commanding Troops along the line requiring train accommodation, under proper authority, for any purpose, must communicate their requirements through their Railway Staff Officers to the Deputy Assistant Director of Railways, who will make the necessary arrangements. If there is no Railway Staff Officer, they should wire direct to the Deputy Assistant Director of Railways.
13. All communications to the Railway Staff should be made through the Railway Staff Officers at stations where such are posted.

By Order,

W. F. KELLY, Major-General,  
*Adjutant-General.*

## EXTRACTS FROM ARMY ORDERS.

## I.

*Army Order No. 1 of 9th January, 1901.*

## ISSUE OF TICKETS.

(a) No Officer, Non-commissioned Officer, man, or camp follower is to be allowed to travel on the Cape Government Railways, Natal Government Railways or Imperial Military Railways, free (*i.e.*, at Imperial Government expense) unless travelling on duty.

(b) Officers, Non-commissioned Officers, men and camp followers proceeding on leave are allowed the indulgence of travelling at half price for the class they may select to travel by.

(c) General Officers Commanding on Lines of Communications should see that Commandants of all stations where railway traffic takes place are supplied with "Order for Military Ticket," M.T. 5, and "Authority to proceed by Rail," M.T. 6.

(d) M.T. 5 should be issued by the Commandant to all military details travelling on duty, and is to be exchanged for a railway ticket by the Station Master. (N.B.—On no account is M.T. 5 to be issued as a railway ticket.)

(e) Every Officer, Non-commissioned Officer, man, or camp follower proceeding on leave must, after his leave has been approved by competent military authority, obtain from the Commandant an "Authority to proceed by Rail," M.T. 6. On presentation of this form to the Station Master he will be permitted to purchase a ticket at indulgence rates.

(f) All Officers, Non-commissioned Officers, men, and camp followers are to voluntarily give up their railway ticket at the termination of their journey to the Railway Staff Officer or other Railway Staff Official (without necessarily being asked for it).

(g) The Senior Officer or Non-commissioned Officer on any train should, as far as possible, prevent anyone travelling without a ticket, and any suspicious person, whether in uniform and in possession of a ticket or not, should be called upon for an explanation of his presence, and should be brought to the notice of the Railway Staff Officer or Railway Military Police. In this way all ranks should make every endeavour to prevent unauthorised persons travelling on the railways.

(h) All civilians (other than camp followers) travelling from one place to another in the Transvaal or Orange River Colonies should be in possession of a special permit (M.T. 7) which can only be issued by the Adjutant-General, Military Governors, General Officers Commanding Districts, Resident Magistrates, Provost-Marshal, Army Headquarters, or Director of Military Intelligence.

Camp followers should always be in possession of Army Book 41 (last pay certificate) and Commandants should not issue M.T. 5 or M.T. 6 unless they can produce their A.B. 41, which book acts as a sort of guarantee at intermediate stations that he is a *bonâ-fide* camp follower.

## II.

*Army Order No. 2 of 24th June, 1901.*

## RAILWAY TICKETS, CLASS OF.

Warrant Officers proceeding by rail on duty are entitled to second-class tickets, but Non-commissioned Officers and men only to third-class tickets. Commandants are responsible that M.T. 5 forms are filled in accordingly.

## III.

*Army Order No. 7 of 8th July, 1901.*

## ISSUE OF RAILWAY TICKETS.

The following Army Orders are cancelled:—

No. 1 of 29th December, 1900.

No. 2 of 21st February, 1901.

No. 1 of 23rd May, 1901.

No. 4 of 28th May, 1901.

(a) Officers, Non-commissioned Officers and men, and recognised camp followers proceeding on duty to coast ports are not to be given return railway permits. Return permits to travel should be obtained from the Staff Officer at the port.

(b) Officers, Non-commissioned Officers and men, and recognised camp followers, proceeding on leave anywhere may be granted return permits to any place at indulgence rates (M.T. 6).

(c) Officers, Non-commissioned Officers and men of South African Irregular Corps who, on re-engagement, are allowed a period of leave, are entitled to railway passage at Government expense to their homes and back, unless otherwise stated, and return permit (M.T. 5) may be issued, except to such men as are proceeding to coast ports, in which case single permits are to be granted, and Officers Commanding Corps should furnish such men with an authority, on presentation of which they will obtain a railway permit at Government expense, when the period of their leave is about to expire, to enable them to rejoin their unit.

## IV.

*Army Order No. 7 of 20th June, 1901.*

Referring to Army Order No. 1 of 9th January, 1901, it has been brought to notice that Commandants of Stations are issuing free railway warrants to Officers and others proceeding on leave of absence. Free railway warrants can only be issued to Officers and soldiers on duty, and the order authorising the journey must be produced before the warrant is issued.

## V.

*Army Order No. 5 of 27th June, 1901.*

**AUTHORITY FOR OFFICERS TO QUIT STATIONS.**

All individual Officers on quitting their stations on duty or leave must be in possession of written orders specifying the duty on which they are proceeding and the place they are going to, or a copy of the order granting them leave.

This authority they may be required to produce to the Staff Officer of any command they pass through; if unable to do so, they are liable to be at once sent back at their own expense to the station they came from.

General and other Officers Commanding Stations are requested to take steps to ensure this order being strictly enforced.

## VI.

*Army Order No. 2 of 12th June, 1901.*

**DISCHARGE OF NATIVES.**

With reference to Army Order No. 2 of 2nd April, 1901, owing to plague restrictions, natives residing in Knysna will for the present proceed by rail to Klipplaat, and march from there to their homes.

They will report their arrival to the Commandant, Klipplaat, who will arrange for sufficient rations being supplied them to enable them to reach their final destination.

## VII.

*Army Order No. 8, dated 24th January, 1900.*

**RAILWAYS.**

Railway trucks must only be kept under load at stations for the shortest possible time, not in any case exceeding 48 hours unless sanction of Director of Railways has been obtained. Officers Commanding and Departments are warned against annexing any railway property, viz., material, tarpaulins, or occupying railway buildings, without authority of the Director of Railways or his Staff. No orders should be given to Civil Staff of Railways, unless in case of emergency, except through Director of Railways or his Staff.

## VIII.

*Army Order No. 3, dated 31st August, 1900.*

Where railway buildings are required for railway service, the Director of Railways is authorised to so inform any Officer or troops that may be occupying them without his permission. Such Officer should at once cause the building to be vacated.

## IX.

*Army Order No. 6, dated 12th April, 1900.*

**USE OF RAILWAY TELEGRAPH.**

As the transmission of non-urgent public and private messages from railway telegraph offices interferes very materially with the railway traffic work, the railway telegraph system is in future to be used in cases of emergency only.

No telegram, public or private, is to be sent from any railway telegraph office, unless previously countersigned by the Commandant of the Station.

Commandants will be held responsible for the urgency of the messages so sent.

## X.

*Army Order No. 8, dated 14th April, 1900.*

## RAILWAY PROPERTY.

Attention is called to Army Order 8, of 24th January, 1900. Any railway property, such as material, tarpaulins, &c., that has been annexed by Officers Commanding or Heads of Departments, without the authority of the Director of Railways or his Staff, will be at once returned.

## XI.

*Army Order No. 3, dated 15th August, 1901.*

## USE OF RAILWAY MATERIAL FOR DEFENCE WORKS.

(a) Railway materials are not to be taken in future for constructing defences. These materials are scarce, and are required for repairing the railway.

Where General Officers Commanding can arrange for the construction of corrugated iron blockhouses to replace defences made of materials required by the Imperial Military Railways they should do so.

(b) The railway fences are about to be restored and must in no case be cut again by the troops. These fences form valuable obstacles to the enemy's movement in conjunction with the blockhouses on the lines.

## XII.

*Army Order No. 4 of 19th March, 1901.*

## RAILWAY PROPERTY—DAMAGE TO TARPAULINS.

It having been brought to notice that many tarpaulins go astray at stations on the railways, or are wilfully damaged, all General Officers Commanding Lines of Communications, Assistant Inspector-Generals of Sections and Station Commandants, must take steps to prevent these irregularities. In every case where loss of, or damage to, tarpaulins is brought to notice by the railway authorities, immediate steps are to be taken to trace the person or persons responsible for such loss or damage, and to charge them with the cost of the tarpaulin.

## XIII.

*Army Order No. 1 of 10th June, 1901.*

## SUPPLIES—LOSS OF, FROM SUPPLY TRAINS.

The attention of General Officers Commanding at all stations is directed to a practice which prevails of troops travelling by supply trains riding on trucks loaded with grain, and displacing the sacks for purpose of shelter. This has led to serious losses of supplies through sacks and packages falling off *en route*.

General Officers Commanding will be held responsible that this practice is discontinued, and will issue to all concerned in their respective districts such instructions as will put a stop to this irregularity.

## XIV.

*Army Order No. 3 of 28th June, 1901.*

## RAILWAYS—DETENTION OF TRAINS ON LINE.

A serious accident having recently occurred owing to a train, while stopping at a military post between stations, being run into by a following train, Commandants of all such posts, camps, and blockhouses along the line are directed to see that trains, when obliged to stop at their posts, are kept for the least possible time, and that all unnecessary delay is avoided. They must pay attention to any warnings or requests made to them by the Train Staff.

## XV.

*Army Order No. 3 dated 14th February, 1901.*

## ARMS AND AMMUNITION LEFT ON RAILWAY STATIONS.

All arms and ammunition left in a railway station more than one week will be returned by the Railway Staff Officers concerned to the nearest Ordnance Depot.

## XVI.

*Army Order No. 4, dated 13th March, 1901.*

## ESCORTS FOR ORDNANCE STORES.

Consignments of ordnance stores, such as guns, ammunition, arms, saddlery and bandoliers, are only to be sent on trains having sufficient escort.

In cases where troops on the trains containing such stores are detrained at an intermediate point they will be replaced from the local garrison. General Officers Commanding will give every facility in this matter.

## XVII.

*Army Order No. 4 of 1st August, 1901.*

## OBSTRUCTIONS TO DRAINS ON RAILWAYS.

It is essential that the waterway in the side ditches along railway lines should not be blocked, either by defences or otherwise.

All solid obstructions to storm water now existing are to be cleared away as soon as possible.

## XVIII.

*Army Order No. 3 of April 20th, 1901.*

## ARMoured TRAINS.

Captain (local Major) H. C. Nanton, R.E., is appointed Assistant Director of Railways, Armoured Trains.

He is responsible for the efficient equipment, garrisoning and technical working of all such trains, and should report to the Adjutant-General, Army Headquarters, Pretoria.

Attention is invited to Adjutant-General (Circ. Memo.) No. 34, which has been issued this day to all concerned.

*Circular Memorandum, No. 34.*

Officers Commanding Sections of Lines of Communications, who consider that, owing to the near approach of the enemy, it is desirable that an armoured train, or trains, should be placed on their section, should communicate with the Assistant Director of Railways, Armoured Trains, who, with the approval of Headquarters, will, as far as possible, place the trains as desired to act under orders of Officers Commanding Lines of Communications.

The normal duty of armoured trains is the protection of traffic, and for this reason the Officer Commanding a train should be allowed the greatest possible freedom of movement on the section on which he is placed, it being his duty to acquaint himself with the most threatened part of the section, and the daily movements of trains over it, so that he may afford them the greatest possible protection.

It must be distinctly understood that a train or trains are placed on the section to meet certain contingencies, and when these no longer exist, the Assistant Director of Railways, Armoured Trains, will remove the trains or train, for duty elsewhere.

To carry out these duties efficiently, armoured trains should not have their headquarters at strongly-held stations, and should, as a rule, only run into these for the purpose of obtaining coal, repairs, &c., and it is preferable that the halting place, whether by day or night, should be at small stations and should constantly vary.

For these reasons it must be distinctly understood that Officers Commanding Sections, Lines of Communications, are on no account to look upon armoured trains as conveniences for inspection purposes, but there is no objection to their being used for this purpose, providing it does not interfere with their patrolling duties.

Communications to the Assistant Director of Railways, Armoured Trains, should be addressed to Headquarters, Imperial Military Railways Offices, Pretoria.

## XIX.

*Army Order No. 2 of 17th May, 1901.*

## ARMoured TRAINS.

Referring to Army Order No. 3 of the 20th April, 1901, it is notified for information that the Assistant Director of Railways, Armoured Trains, Pretoria, is solely responsible to the Adjutant-General, Army Headquarters, for the personnel, Officers and men, and armament of armoured trains, and changes are not to be made in such personnel and armament without reference to him.

## XX.

*Army Order No. 10 of 4th June, 1901.*

## CONFIDENTIAL CIRCULAR MEMORANDUM.

Attention is invited to A.G. (Circ. Memo.) No. 42, which has been issued this day to all concerned.

*Circular Memorandum, No. 42.*

It has been brought to notice that numbers of unauthorised persons, both men and women, are constantly to be found loitering about on the platforms of railway stations. The following Notice, issued by the Director of Railways, and ordered to be posted up on every platform, is perfectly clear, and should absolutely prevent this irregularity :—

## “NOTICE.

“ No Civilians, other than Railway and Telegraph Officials and *bond-fide* Passengers, who must be in possession of a Railway Ticket or Pass, are allowed on Station premises, except by permission of the Railway Staff Officer.”

The General Commanding-in-Chief holds Station Commandants personally responsible that these orders are strictly enforced.

## XXI.

*Army Order No. 1 of 26th March, 1901.*

## IMPERIAL MILITARY RAILWAYS EMPLOYÉS—TRIAL OF.

Some misapprehension having arisen with regard to the status of employés of the Imperial Military Railways who are not soldiers, it is notified for information that all such persons are, during the continuance of active service, subject to Military Law under Section 176/9 of the Army Act. They should, therefore, when charged with an offence be dealt with under Military instead of Martial Law, and tried by Court Martial instead of by a Military Court under Martial Law.

## XXII.

*Army Order No. 4 of 21st August, 1900.*

## DISCIPLINE.

Several cases of theft of both public and private goods have recently occurred on the Imperial Military Railways north of Norvals Pont.

Officers travelling in charge of troops on railway trains will in future see that the train is properly “policed” at every halting place.

Commandants of Stations on the line will see that all details travelling on a train are put under charge of an Officer or responsible Non commissioned Officer before the train leaves his station.

Station Commandants, Railway Staff Officers, and Station Masters will also take more effective steps for the “policing” of trucks with stores standing in their station.

Any man found stealing from a train will be immediately tried by a Field General Court Martial, to be convened by the Senior Officer on the spot (not necessarily the Senior Officer at the station). The members of the Court will, when deciding their sentence, bear in mind the grave nature of the crime. The proceedings of the Court Martial will be forwarded to the General Officer Commanding Lines of Communications in whose section the Court was convened.

If there are sufficient Officers on the train, and the prisoner and witnesses are also travelling by train, the Court can be held on the train to avoid any delay.

This order will be posted up in every station on the Imperial Military Railways system.

## APPENDIX C.

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TABLES showing Details of Temporary, Semi-permanent, and Permanent  
Repairs to all Railways :—

CAPE GOVERNMENT RAILWAYS,  
NATAL GOVERNMENT RAILWAYS,  
IMPERIAL MILITARY RAILWAYS.

I.—TABLE showing Details of Repairs to Cape Government Railways from Orange River to Mafeking.

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Men Employed.	Time of				Permanent or Semi-permanent Reconstruction without interrupting Traffic.	Men Employed and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
589	Double 9' 0" culvert destroyed	Replaced with sleeper crib	Major Stewart, R.E., Capt. Waghorn, R.E., 8th Co. R.E., 31st Co. R.E., 11th Co. R.E., 200 Natives	6 A.M.	23.11.99	10.45 A.M.	23.11.99	All permanent repairs on Cape Government Railways, except Modder River Bridge and Norval's Pont, were carried out by Cape Government Railways	.. ..	Lord Methuen's troops reached Belmont Station 10 A.M., 23.11.99, after a severe fight
	15 lengths rails pulled up	Re-laid .. ..	do.	do.	do.	do.	do.	do.		
	Double 9' 0" culvert destroyed	Replaced with sleeper crib	do.	do.	do.	do.	do.	do.		
	do.	do.	do.	do.	do.	do.	do.	do.		
	Three culverts destroyed	.. ..	do.	..	..	do.	do.	do.		
Belmont Station	Water supply damaged ..	Repaired .. ..	Advance party from Major Stewart's	..	24.11.99	..	24.11.99	do.	.. ..	General Methuen's force, camp, Belmont. Armoured train with Construction Party sent on ahead
599½ Grasspan Siding	9' 0" span destroyed ..	Construction Party fired on by enemy in force with guns, obliged to cease repairs and retire	Party in armoured train. Capt. Waghorn superintended construction	..	do.	..	do.	do.		
601	9' 0" culvert destroyed ..	Replaced with timber ..	Major Stewart's	noon	25.11.99	6 P.M.	25.11.99	do.	.. ..	General Methuen fought action at Grasspan, or Enslin, capturing position, 25.11.99
602 to 603	Two culverts destroyed ..	do.	Field Section, R.E., Capt. Waghorn. During fight R.E. employed dragging naval guns into action and acting escort to them	do.	do.	do.	do.	do.		
	150 yards permanent way torn up	Re-laid .. ..	do.	do.	do.	do.	do.	do.		



602 to 203	Two culverts destroyed ..	Replaced with timber ..	Major Stewart's Field Section	..	26.11.99	..	26.11.99	do.	..	..	..	26.11.99	
619	90 yards of permanent way torn up	Re-laid ..	do.	..	do.	..	do.	do.	..	..	..	26.11.99	
	Two culverts destroyed ..	Required ..	Major Stewart's Field Section, Capt. Waghorn, R.E., superintending	6 A.M.	28.11.99	Delayed all day by action proceeding on Modder River	..	do.	..	..	..	28.11.99	
	One length rails torn up	Construction Train had to retire as it was under shell fire—action of Modder River having begun. Rail length was relaid. Royal Engineer Construction Party went into the firing line at noon, and crossed the river, and remained there till next morning	do.	do.	do.	do.	do.	do.	..	..	..	..	
620	Two culverts destroyed ..	Repaired ..	do.	8 A.M.	28.11.99	noon	28.11.99	do.	..	..	..	..	
	Five rail lengths permanent way pulled up	Re-laid ..	do.	do.	do.	do.	do.	do.	..	..	..	..	
Modder River Bridge	Eight spans of 80' 0" each. Two piers demolished and one badly damaged. Five spans girders, one end of each damaged and dropped	Made low-level deviation and bridge. Length of deviation, 1,500 yards; maximum gradient, 1.25; necessitated very heavy cutting to a depth of 20' 0". Length of low-level bridge, 228' 0"; following spans, 16' 0", 19' 0", 19' 0", 15' 0", 15' 0", 15' 0", 13' 0", 13' 0", 13' 0". Timber on low crib piers bolted together and Elled with stone	Major Stewart's Field Section, Capt. Waghorn, R.E., superintending, 300 Natives, 400 Infantry	noon	29.11.99	..	7.12.99	Damaged portions of girders cut off and replaced by new pieces made in Cape Town shops and sent up. Two S. spans jacked up on cribs, N. spans pulled up by derrick and tackle and supported by trestle and cuttlever. Damaged masonry pulled down and piers built to level	Capt. Waghorn, 8th Co. R.E., 31st Co. R.E.; delayed by non-arrival of new pieces from Cape Town. Commenced about 15.12.99, bridge opened 4.4.00	..	..	..	General Methuen's force crossed Modder, 29.12.99. Further advance stopped by enemy at Magersfontein
626	Double 12' 0" culvert destroyed	Replaced with timber ..	Capt. Waghorn, R.E., with R.E. party of Western Field Section worked by day; Lieut. Micklem, R.E., with Works Section of Midland Field Section worked by night	3.30 P.M.	16.2.00	10 P.M.	16.2.00	..	..	..	..	..	Enemy having evacuated Magersfontein, General Methuen advanced, 16.2.00. Gen. French entered Kimberley, 16.2.00; Methuen, 18.2.00
	30 rail lengths permanent way blown up	Re-laid ..	do.	do.	do.	do.	do.	do.	..	..	..	..	..
	Double 20' 0" culverts destroyed	Replaced with timber	do.	do.	do.	do.	do.	do.	..	..	..	..	..
	Two 10' 0" culverts destroyed	do.	do.	do.	do.	do.	do.	do.	..	..	..	..	..

TABLE showing Details of Repairs to Cape Government Railways from Orange River to Mafeking—(continued).

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Men Employed.	Time of				Permanent or Semi-permanent Reconstruction without interrupting Traffic.	Men Employed and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
Merton Siding	40 rail lengths permanent way blown up	Re-laid .. .. .	At noon on 19.2.00 met working party from Kimberley working south	..	17.2.00	noon	19.2.00	Subsequently permanently repaired by Cape Government Railways		
	200 yards permanent way torn up	Do.	do.	..	do.	do.	do.	do.		
	Two 10' 0" culverts destroyed	Filled in .. .. .	do.	..	do.	do.	do.	do.		
	200 yards permanent way torn up	.. .. .	do.	..	do.	do.	do.	do.		
Railway communication reopened with Kimberley, noon, 19.2.00, which had been besieged by the enemy since 13.10.99										
667	Five 20' 0" spans destroyed	Replaced with timber ..	Capt. Fuller, R.E., Works Section of Western Field Section	..	noon	16.3.00	8.30 P.M.	17.3.30	All permanent repairs on Cape Government Railways, except Modder River Bridge and Norvals Pont, were carried out by Cape Government Railways	
673	Double 20' 6" span destroyed	do.	do.	do.	do.	do.	do.	do.	do.	
676	Culvert destroyed ..	do.	do.	6 A.M.	18.3.00	8 A.M.	20.3.00	do.	do.	
677	30' 0" span destroyed ..	do.	do.	do.	do.	do.	do.	do.	do.	
678	Double 6' 0" culvert destroyed	do.	do.	do.	do.	do.	do.	do.	do.	
Koodoo Siding	One set points and crossing destroyed	Replaced with new set	do.	8.30 A.M.	20.3.00	6 P.M.	21.3.00	do.	.. .. .	Army remained halted, with advance force at Warrenton
679	Culvert destroyed ..	Replaced with timber ..	do	do.	do.	do.	do.	do.	.. .. .	



TABLE showing Details of Repairs to Cape Government Railways from Orange River to Mafeking—(continued).

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Men Employed.	Time of				Permanent or Semi-permanent Reconstruction without interrupting Traffic.	Men Employed and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
Kraaipan Siding	Armoured train wrecked at commencement of war. Blocked line	Wreckage cleared .. ..	Capt. Fuller, R.E., Works Section of Western Field Section and 300 Natives, about 1,200 Infantry	..	30 5.00	..	30.5.00	All permanent repairs on Cape Government Railways, except Modder River Bridge and Norvals Pont, were carried out by Cape Government Railways		
832	40' 0" span destroyed ..	Replaced with timber.. ..	do.	..	31 5.00	morning	1.6.00	do.		
833	20' 0" do. ..	do.	do.	..	1.6.00	..	2.6.00	do.		
845	50' 0" bridge destroyed ..	Made diversion 400 yards long	do.	..	2.6.00	..	9.6.00	do.		
834 to 840	Six miles permanent way torn up and turned over	Re-laid .. ..	do.	..	do.	..	do.	do.		

On 9.6.00 the working party from Mafeking was met just north of Maritzam Siding, and the construction train ran into Mafeking, where it was received by crowds of people shouting "Have you brought any whisky?"  
 Rail communication, Cape Town to Mafeking, was re-opened for the first time since 12.10.99.

II.—TABLE showing Repairs to Cape Government Railways from Rosmead to Stormberg.

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Men Employed.	Time of				Permanent or Semi-permanent Reconstruction without interrupting Traffic.	Men Employed and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
Thebus Bridge	One 75' 0" span, 18' 0" above river bed, two 20' 0" spans. 75' 0" span main girder practically intact. End floorbeams and stringers destroyed each end. Piers, tops destroyed and broken and cracked for some distance down. 20' 0" spans badly damaged. Abutments undamaged.	Cribbed up centre span, replaced 20' 0" spans by timber on sleeper crib piers. Put wood strut in girder. Also laid in a siding at station	Lieut. Micklem's R.E. Construction Party, composed as under: 1 Officer, 52 N.C.O.'s and Men, 10th Co. R.E.; 1 Officer and 52 N.C.O.'s and Men, 42nd Co. R.E.; 1 Civilian Permanent Way Inspector; 4 Gangers; 93 Natives	3.30 P.M.	24.1.00	7 A.M.	28.1.00	Subsequently carried out by Cape Government Railways	.. ..	Force did not advance
?	20' 0" masonry arch destroyed	28' 0" span strut and straining beam bridge erected	Major Goodwin, R.P.R., and 4th Co., R.P.R.	6.30 A.M.	7.3.00	4.30 P.M.	7.3.00	do.	.. ..	No force marching except escort to Railway Party
246-0	Two 9' 0" spans destroyed	Replaced with timber ..	do.	5 P.M.	do.	noon	8.3.00	do.	.. ..	
245-0	Cutting blocked with rocks	Rocks cleared out ..	do.	12.30 P.M.	8.3.00	6 P.M.	do.	do.	.. ..	
243½	One 9' 0" span destroyed	Replaced with timber ..	do.	do.	do.	do.	do.	do.	.. ..	
242	Two 20' 0" spans. Girders destroyed	do.	do.	7 P.M.	do.	10.30 A.M.	9.3.00	do.	.. ..	
231	50' 0' span damaged ..	do.	do.	11.30 A.M.	9.3.00	9.30 P.M.	do.	do.	.. ..	No force marching except escort to Construction Party
232½	75' 0" span broken down	do.	do.	10 P.M.	do.	5.30 P.M.	11.3.00	do.	.. ..	
232½ to 226	Several breaks to permanent way	Repaired .. ..	do.	5.30 P.M.	11.3.00	midnight	do.	do.	.. ..	
226	Bamboo bridge destroyed	Replaced with timber ..	Cape Government Railways	..	8.3.00	..	12.3.00	do.	.. ..	

III.—TABLE showing Repairs to Cape Government Railways from Naauwpoort to Orange River.

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Men Employed.	Time of				Permanent or Semi-permanent Reconstruction without interrupting Traffic.	Men Employed and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
294-32	Two lengths rail torn up	Replaced	Construction Party under Lieut. Micklem, R.E., as under: 1 Officer and 52 N.C.O.'s and men 10th Co. R.E.; 1 Officer and 52 N.C.O.'s and men 42nd Co. R.E.; 1 Permanent Way Inspector, 6 Civilian Gangers, 150 Natives	6.15 P.M.	27.2.00	6.45 P.M.	27.2.00	Permanent repairs were subsequently carried out by Cape Government Railways	.. ..	General Clements advanced from Arundel 28.2.00
296-40 Rensburg Siding										
301-30 Pleuman Siding										
301-42	10' 6" culvert rails removed. About 35 trucks previously escaped from Rensburg derailed. Track damaged by derailment for 200 yards	Several trucks re-railed, remainder pulled clear of line. Permanent way repaired	do.	do.	do.	do.	do.	do.		
301-78	15' 0" culvert blown up ..	Timber baulks on sleeper cribs piers	do.	2.0 P.M.	28.2.00	2.0 P.M.	2.3.00	do.	.. ..	His advance guard having advanced on 27th and pushed past Rensburg
302-6	10' 0" do.	do.	do.	do.	do.	do.	do.	do.		
302-8	6' 0" do.	do.	do.	do.	do.	do.	do.	do.		
303-40	30' 0" culvert damaged ..	Girder cribbed up	do.	do.	do.	do.	do.	do.		
303-43	10' 0" do. destroyed..	Timber baulks on sleeper crib piers	do.	do.	do.	do.	do.	do.		



TABLE showing Repairs to Cape Government Railways from Naauwpoort to Orange River—(continued).

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Men Employed.	Time of				Permanent or Semi-permanent Reconstruction without interrupting Traffic.	Men Employed and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
329-0 Norval's Pont Bridge	Twelve spans of 130' 0" each. Three spans, 4th, 5th and 6th, destroyed. Girders blown in half and much damaged. One pier steel cylinder filled with concrete, 43' 6" high, destroyed. One pier badly cracked	Concrete piers of low-level bridge previously used by Cape Government Railways on construction were found to be intact and showing just above water. River low. 65 yards wide at bridge, deepest channel, 10' 0". Formation level of deviation made by Cape Government Railways on construction in fair order both sides of river till within 500 yards of river each side, where entirely disappeared by silting up. Remade formation level and put down permanent way, necessitated considerable excavation up to 14' 0", also banking up to 10' 0", considerable amount of rock bank to make. Length of deviation, 1 mile 1070 yards, maximum gradient, 1/20, minimum curve, 18 degrees. Made low-level bridge following spans: 40' 0", 9' 6", 9' 6", 9' 0", 30' 0", 10' 0", 10' 0", 10' 6", 12' 6", 12' 6", 40' 0", 20' 0". The 40' 0" spans were crossed by four baulks under each rail, two 18" x 18" baulks side by side, above these two 16" x 16" side by side	Lieut. Micklem's Construction Party, detail as before. 1 more R.E. subaltern joined Construction Party 15.3.00, and left 19.3.00. Half Batt. R.P.R. worked at making formation level and laying permanent way on north bank from 17.3.00 to 24.3.00. 1 Officer and 35 Men, 20th Co. R.E.	9 P.M.	15.3.00	Opened for traffic 6 P.M. 27.3.00 Continued work, putting in 1,450 yards siding and improving deviation till 7.4.00	Destroyed pier rebuilt. Cracked pier strengthened by encasing with masonry. The three undamaged spans on south side pulled northward for a length of one span. Undamaged spans on north side pulled southward for a length of two spans. This left shore span on south side and two north spans unbridged, but owing to slope of bank the height was much less in these spans, in fact, water-way of shore span north side was so small that this was filled in with rock. The remaining two spans were bridged with trestles and Bates' girders, three spans, 45' 0" each, concrete foundations to trestles several feet above low water, owing to slope of banks. This was practically permanent repair, proof against floods, but the replacing of the two spans of trestles by girders of same pattern as remainder of bridge was left to Cape Government Railways	Lieut.-Col. Capper, R.E.; Major Seymour, R.P.R.; 5 Cos. R.P.R. arrived 16.3.00. Bridge opened for traffic, night of 20.5.00	General Clements halted during repairs, and crossed Orange River, 15.3.00	
		A 1-ton aerial tram, running on wire cables, hauled backwards and forwards by wire hauling engine, was arranged by R.P.R. This delivered at its best 100 tons in 24 hours	Half Batt. Railway Pioneer Battalion	..	16.3.00	First load taken across .. 25.3.00				

Line was undamaged between Orange River and Bloemfontein, so railway communication with Bloemfontein was open on 27.3.00. Lord Roberts reached Bloemfontein 13.3.00.



IV.—TABLE showing Repairs to Cape Government Railways from Molteno to Bethulie.

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Men Employed.	Time of				Permanent or Semi-permanent Reconstruction without interrupting Traffic.	Men Employed and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
210 Molteno Station	9' 0" culvert girders destroyed	Replaced with timber..	..	5.3.00	noon	5.3.00	Permanent repairs subsequently carried out by Cape Government Railways			
218 Twist Niet Siding	Loop siding torn up. Few rail lengths main line torn up	Main line re-laid ..	do.	..	..	do.	do.	do.		
219	Over one mile permanent way entirely removed	Re-laid ..	do.	..	..	do.	do.	do.		
235	15' 0" masonry arch culverts demolished	Replaced with timber..	do.	..	do.	4 P.M.	7.3.00	do.		
236 Wonder-boom Bridge	$\frac{1}{2}$ mile permanent way overturned	Re-laid ..	Major Graham-Thomson, R.E., 12th Field Co.	6 A.M.	8.3.00	10 A.M.	8.3.00	do.		
	Central pier partially destroyed by dynamite. Girder damaged	Undermined girder with sleepers. Strutted girder with rails between top and bottom boom	Capt. Burn, R.E., four civilian platelayers, 50 Natives	1.30 P.M.	do.	5 P.M.	do.	do.		
248	10' 0" culvert destroyed..	Replaced with timber..	do.	2 P.M.	10.3.00	do.	10.3.00	do.		
260-43	50' 0" span masonry abutment damaged. Girders undamaged except longitudinal girders	Cribbed up girder and replaced some longitudinal girders with timber	do.	7 A.M.	11.3.00	2.45 P.M.	11.3.00	do.		
278-46	Two 50' 0" spans. One span completely wrecked	Made diversion 200 yards long	do.	5 P.M.	do.	12.30 P.M.	13.3.00	do.		
255 Stormberg Spruit Bridge	Three spans, 150' 0" each. Bottom boom and part of lattice work cut by dynamite near southern pier	Cribbed up girders necessitated cribs 36' 0" high	BURGHESDORP ALI WAL NORTH BRANCH.							
			Major Graham-Thomson, R.E., working party as before. Capt. Burn, R.E.	10 A.M.	14.3.00	5.50 P.M.	16.3.00	do.		

No further damage between Burghersdorp and Aliwal North.

TABLE showing Repairs to Cape Government Railways from Molteno to Bethulie—(continued).

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Men Employed.	Time of				Permanent or Semi-permanent Reconstruction without interrupting Traffic.	Men Employed and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
284-62 Bethulie Bridge over Orange River	Eight spans of 120' 0" each; two 50' 0" spans; girders of five spans over water cut in half, dropped into river bed, and smashed. A low-level bridge on concrete piers had existed previously, having been made by Cape Government Railway on first construction. These piers, averaging about 8' 0" high, had been pulled over, but water being shallow, though stream strong, the surface of these piers was just above water, but as piers had naturally settled and then tapered from base to top now that they lay over, they did not present horizontal surface, nor did they bear evenly on bed of river	Gen. Gatacre's advance guard had succeeded in preventing destruction of road bridge over Orange River Bridge. This bridge was one mile lower down river than railway bridge. It was not strong enough to take engines, but was just strong enough to take loaded trucks, so, as a considerable quantity of engines and rolling stock had been captured north of Orange River, it was decided that quickest method of getting railway communication would be to lay diversion 2½ miles long over road bridge to pass trucks over. Maximum gradient for very short distance, 1/20; otherwise, 1/37. This having been completed, a low-level bridge for thorough traffic was made by levelling the surface of the fallen low-level concrete piers with concrete, bolting wood transoms to these, and spanning with timber baulks. The foundation given by fallen concrete piers was not sound, but nevertheless the bridge was used for over a year without mishap. Very heavy excavation was necessary on both banks of the river. Length diversion, 1,800 yards; maximum gradient, 1/25; length of low-level bridge, 1,004 feet.	Lieut. Col. Foley, R.E., Major Graham-Thomson, R.E., 12th Field Co., R.E., 100 Natives, 100 Infantry. Working party laid diversion over road bridge, and then handed over to R.P.R. to complete the packing of permanent way, getting track into good order, and putting in sidings on N. and S. banks	6 A.M.	18.3.00	Opened for traffic, 27.3.00. Delayed by want of material, as Norvals Pont, being more important, had first call on material trains.	It was arranged with the Cape Government Railways that the Director of Railways should repair Norvals Pont Bridge and put in deviations at Bethulie Bridge, and Cape Government Railways would repair permanent high-level bridge at Bethulie. The high-level bridge at Norvals Pont was opened for traffic on 20.5.00. The Bethulie high-level bridge has not yet been opened for traffic (30.4.01)			
			Major Goodwin, R.P.R., and half battalion R.P.R. took over from Major Graham-Thomson, R.E., after diversion over road bridge had been laid, completed packing of track, put in sidings, and then made diversion and low-level railway bridge	..	27.3.00	..	10.5.00	do.		

The railway between Bethulie and Bloemfontein was undamaged, so railway communication with Bloemfontein *via* Bethulie was open on 27.3.00, simultaneously with the opening of the line *via* Norvals Pont.

V.—TABLE showing Repairs to Imperial Military Railways from Bloemfontein to Pretoria.

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Officer in Charge and Working Party.	Time of				Permanent or Semi-permanent Repairs.	By Whom carried out and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
468-70 Glen Bridge over Modder River	Four spans, 100' 0" each. Two centre spans destroyed. Girders badly damaged. One pier top destroyed. Whole pier shaken to ground	Reconstructed deviation previously used on construction by Cape Government Railway necessitated considerable earthwork; re-laid permanent way. Length of deviation, 1 mile 56 chains; maximum gradient, 1/40; minimum curve, 297' 0" radius. Low-level bridge four spans trussed timber beams, 29' 6", 29' 6", 18' 0", 18' 0" clear, on sleeper crib piers. Also 28' 0" trussed beam over donga	Lieut. Buckle, R.E., Half Co. 9th Co. R.E.; 1 Officer, Half Co. 7th Co. R.E.; 100 Infantry; 4 Civilian Carpenters; 4 Railway Gangers; 60 Natives	Completed in 17 days, no urgency, as Army was halted				Damaged pier pulled down and rebuilt. Girders for one span made up from two damaged spans, other span replaced by new. Girders launched	Opened for traffic 27.7.00. Carried out by District Engineer, Bloemfontein, with men of Works Department. Bridge completed 22.7.00	Army halted at Bloemfontein. Advance force at Karree Siding
477-0	Two 50' 0" spans. Pier destroyed, abutments practically intact. Girders intact except ends and part of flooring	Jacked up girders on sleeper cribs, bridging gap between girders with timber	Lieut. Micklem, D.S.O., R.E., and Construction Party as follows: 1 Officer, 47 N.C.O.'s and Men, 42nd Co. R.E.; 1 Officer, 40 N.C.O.'s and Men, 10th Co. R.E.; 13 Infantry details; 1 Civilian Permanent Way Inspector; 230 Natives	2.30 P.M.	3.5.00	noon	4.5.00	Masonry rebuilt. New ends to girders made in Bloemfontein and riveted on	Carried out by A. W. Herbert, Esq., C.E.	3.5.00
480-61	Double 9' 0" culvert	Replaced with baulks on sleeper crib piers	do.	do.	do.	do.	do.	Masonry rebuilt. New girders put in	do.	
485-3	One 50' 0" span. South abutment shattered. South end and flooring of girders destroyed. North end girders and north abutment intact. Height of rail level above stream bed, 28' 0"	Jacked up girders on treble sleeper crib, bridged gap south end with timber	do.	3 P.M.	4.5.00	1 P.M.	5.5.00	Masonry rebuilt by contract. New 50' 0" spans erected	Carried out by A. W. Herbert, Esq., C.E., with men of Works Department. Permanent bridge opened for traffic 29.7.00	5.5.00

TABLE showing Repairs to Imperial Military Railways from Bloemfontein to Pretoria—(continued).

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Officers in Charge and Working Party.	Time of				Permanent or Semi-permanent Repairs.	By Whom carried out and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
485-8 Brandfort Station	Water tanks damaged ..	Repaired								
492-1	One 50' 0" span. Both abutments shattered. All four ends of girders and flooring badly damaged, and girders lying in river bed. Height about 12' 0"	Raised central undamaged portion of girders, supported same on two treble cribs. (Gaps between girders and bank bridges with timber	Lieut. Micklem, D.S.O., R.E., and Construction Party as follows: 1 Officer, 47 N.C.O.'s and Men, 42nd Co. R.E.; 1 Officer, 40 N.C.O.'s and Men, 10th Co. R.E.; 13 Infantry details; 1 Civilian Permanent Way Inspector, 230 Natives	1.30 P.M.	5.5.00	9.30 A.M.	6.5.00	Masonry rebuilt by contract. New 50' 0" deck span erected	Carried out by A. W. Herbert, Esq., C.E., with men of Works Department. Permanent bridge opened for traffic 9.8.00	
492-7 Houtenbeck Siding										
498-36	Two 30' 0" spans, 15' 0" above river bed. Pier completely destroyed. Girders badly broken and useless	Replaced with timber baulks on sleeper cribs	do.	11 A.M.	6.5.00	8.30 A.M.	7.5.00	Masonry rebuilt by contract. New 30' 0" spans erected	Carried out by A. W. Herbert, Esq., C.E., with men of Works Department. Permanent bridge opened for traffic 24.8.00	
506-29 Vet River Bridge	Five 100' 0" spans. Nos. 1, 2 and 3 piers shattered. Three spans complete wreck. Girders of south spar, one end leaning on abutment, other end in river bed. Greatest height rails above river	Reconstructed formation level of deviation previously used by Cape Government Railways on construction, considerable excavation necessary, laid permanent way on deviation, and made low-level skew timber bridge	Lieut. Micklem's Construction Party, detail as before. 8.5.00, 2 R.E. Officers, 100 Natives joined to work under Lieut. Micklem. 9.5.00, 1 R.E. Officer joined. 10.5.00, 20	10.30 A.M.	7.5.00	noon	13.5.00	Semi-permanent repair: High-level timber trestle bridge. Concrete foundations on line of permanent bridge	Major Swinton, R.E. 4 Cos. R.P.R. commenced noon, 14.5.00. Opened for traffic, 1.30 P.M., 14.6.00	7.5.00

bed, 65' 6". Water tank destroyed. Pump and boiler destroyed	on sleeper crib piers over river in which only one foot of water, also three timber bridges on crib piers over dongas. Spans over river, 16' 0", 21' 0", 18' 4", 20' 8". Spans over three dongas, 14' 0", 25' 4", 12' 7", 23' 3", 16' 9", 21' 0", 14' 6". Length deviation, 1 mile 17 chains; maximum grade, 1/37; minimum curve, 17 degrees	N.C.O.'s and Men, 20th Co. R.E., joined. 13.5.00, Civilian Permanent Way Inspector and 125 Natives joined. Capt. Lloyd, R.E., and section Volunteer Company, Electrical Engineers, put up electric lights for night work. Reliefs by day of Infantry working parties, 400 in each relief. Capt. Travers, R.E., and C Troop Pontoons bridged one donga	..	10.5.00	midnight	13.5.00	Masonry rebuilt. New girders put in	Permanent repair: Masonry rebuilt by contract. Five new 100' 0" spans erected by contract	Contractor, F. M. Garrett, Esq., supervised by A. W. Herbert, Esq. Permanent bridge opened for traffic 31.12.00	7.5.00
From mile 506½ to mile 512	Five culverts destroyed. Permanent way blown up in four places	Culverts replaced with baulks on sleeper crib piers. Advance party sent on, material supplied to them by wagons, which, however, too few to supply well	Advance party from Lieut. Micklem's party, consisting of Corp. Taylor, 8 Plate-layers, 50 Natives	..	10.5.00	midnight	13.5.00	Masonry rebuilt. New girders put in	Carried out by A. W. Herbert, Esq., C.E., with men of Works Department	7.5.00
513 Smalldean Station	Double 9' 0" culvert damaged	Repaired with timber..	Lieut. Micklem's party	5.30 A.M.	14.5.00	6 A.M.	14.5.00	do.	do.	8.5.00
527-47 Doorn River Bridge	One 100' 0" span, one 20' 0" span. Pier and abutments shattered. Girders badly damaged. Height of rail level above river bed about 40' 0"	Built timber bridge, greatest height above bed 34', alongside damaged bridge sufficiently clear to allow permanent repairs. Timber baulks on sleeper crib piers. Spans 14' 3", 18' 0", 21' 6", 19' 0", 18' 0", 20' 0", 21' 0". Height of crib piers 3' 0", 9' 3", 14' 6", 27' 6", 31' 6", 29' 6", 12' 0". Diverted line on to new bridge, necessitating 200 yards new track	Lieut. Micklem's party, except 1 N.C.O., 39 Plate-layers, and 80 Natives left behind to improve Vet deviation	7 A.M.	14.5.00	9 A.M.	17.5.00	Masonry rebuilt by contract. Girders repaired with pieces of broken girders at Glen Bridge	Carried out by L. H. Greir, Esq., C.E. Opened for traffic about 20.9.00	9.5.00
From mile 527 to mile 538	Five culverts destroyed. Permanent way destroyed in four places, six rail lengths at each place	Replaced culverts with timber on sleeper cribs. Re-laid permanent way. Sent out material by wagon, but only four wagons	Corp. Taylor's advance party	..	14.5.00	4.30 P.M.	17.5.00	Masonry rebuilt by contract. New girders put in	Carried out by A. W. Herbert, Esq., C.E.	9.5.00

TABLE showing Repairs to Imperial Military Railways from Bloemfontein to Pretoria—(continued).

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Officer in Charge and Working Party.	Time of				Permanent or Semi-permanent Repairs.	By Whom Carried out and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
538-7 Zand River Bridge	Five spans, 100' 0" each, girders. Three northern spans destroyed, one pier completely demolished, one badly shattered. Height of rail level above river bed 53' 0". Boiler of steam pump destroyed	Reconstructed deviation previously used by Cape Government Railway on construction necessitated considerable earthwork. Laid permanent way on deviation. Length of deviation, 1 mile 44 chains; maximum gradient, 1/40; minimum curve, 17 degrees. Three out of four concrete piers of low-level bridge previously used by Cape Government Railway were standing and, though shaky, were used, the missing pier replaced by sleeper crib. Spans were crossed with timber baulks. Following widths of spans, 14' 0", 1' 0", 26' 0", 19' 0", 14' 0", 13' 0". Following spans over dongas, 13' 0", 13' 0", 9' 6", 8' 0"	Lieut. Micklem's Construction Party, detail as before. 1 R.E. Officer and 22 Infantry details joined Lieut. Micklem 18.5.00. 300 Natives with Civilian Gangers joined Lieut. Micklem 20.5.00. Electric Light Section under Capt. Lloyd, R.E., put up lights for night work. Reliefs, Infantry working parties by day, averaging 300 each relief	4.30 P.M.	17.5.00	2.30 A.M.	23.5.00	Semi-permanent repair: High-level trestle bridge on concrete foundation on line of permanent bridge. Permanent repairs: Masonry rebuilt by contract with Rowe and Marshall. Five new 100' 0" spans erected by contract with F. M. Garrett, Esq.	Lieut. Col. Capper, R.E. Three Cos. R.P.R. commenced work 12.6.00. Opened for traffic 16.7.00. Work stopped for 12 days, as working party had to man defences, also hindered throughout by presence of enemy. Contractors supervised by A. W. Herbert, Esq., C.E. Permanent bridge opened for traffic 10.5.01. Work commenced 5.2.01	10.5.00
From 542½ to 543½	Over 1,000 yards of permanent way destroyed by bursting dynamite charge under alternate rail joints, necessitating new rails	Re-laid permanent way. Material sent on by wagon and trolley	Corp. Taylor's advance party	..	18.5.00	..	23.5.00			
542-50	Points and crossings sidings destroyed			8 A.M.	23.5.00	6 P.M.	23.5.00	Masonry rebuilt by contract New 50' 0" deck span erected. 20' 0" spans replaced with timber	Carried out by A. W. Herbert, Esq., with men of Works Department. Permanent bridge opened for traffic 15.9.00	10.5.00
544-31 Riet River Bridge	One 50' 0", two 20' 0" spans completely destroyed. Rail level above river bed 15' 0"	Pulled damaged girders out of way. Replaced on same alignment by baulks on sleeper crib piers. Spans 15' 0", 12' 0", 21' 6", 13' 9", 13' 6"	Lieut. Micklem's party, except 1 Officer, several flatelayers and 350 Natives left at Zand River to improve deviation							

545-18	Double 9' 0" destroyed ..	Replaced with timber on crib piers	..	..	..	..	..	..	do.	
550-62 Venterburg Road Station	Points damaged. Water tank damaged	Repaired ..	..	..	Small party left behind to do this	..	..	..	Masonry rebuilt by contract. New girders put in	
557-20 Hofontein Siding										
564-27 Geneva Siding	Line not damaged									
569-54 Boschrand Siding										
576-39 Valseh River Bridge	Five spans 100' 0" each; maximum height rail level above bed of stream, 70' 0". All girders badly damaged, lying in bed of river. All piers shattered	Concrete piers of low-level bridge on deviation previously used by Cape Government Railways still standing intact on 5-chain curve. Reconstructed deviation previously used by Cape Government Railways necessitated considerable excavation, and in one place where houses blocked old route some shallow rock cutting required. All material had to be found in neighbourhood and brought by wagon. Low-level bridge, height above bed of stream, 3' 0"; 34 spans, three 14' 4", remainder 8' 9" each. Bridge over donga, 11' 6", 12' 8", 13' 0". Length deviation, 2 miles. Maximum gradient, 1/35; minimum curve, 5 chains	Gen. Sir Elliot-Wood, R.E., and Staff. Lieut.-Col. Rochfort Boyd, R.E.; Lieut.-Col. Foley, R.E.; 12th Field Co. R.E.; 9th Field Co. R.E.; 26th Field Co. R.E.; Pontoon Troop R.E.; Rifle, Infantry working parties, averaging 1,500 men; 300 Natives; District Engineer, E. Bromley, Esq., C.E.; 1 Permanent Way Inspector; 6 Civilian Platelayers	evening	13.5.00	evening	23.5.00	Masonry rebuilt by contract. Four spans girders made up out of damaged girders of this bridge and damaged girders Zand River. The fifth span filled with tree-trunks on concrete foundations	Carried out by L. H. Greir, Esq., C.E. A. W. Herbert, Esq., C.E., superintended launching all spans. Permanent bridge opened for traffic 28.11.00	Arrived evening 12.5.00, left 22.5.00
598-76 Honing Spruit Station										
608-28	Three 30' 0" spans, rail level 6' 0" above river bed. Central span badly damaged, two other spans damaged one end only. Both piers demolished	Jacked up shore spans on cribs, cleared away centre span and replaced with timber on sleeper cribs	Lieut. Micklem's Construction Party, detail as before	noon	24.5.00	9 a.m.	25.5.00	Rebuilt masonry by contract. New 30' 0" through span erected in centre span. Two other spans repaired	Carried out by E. Bromley, Esq., C.E., with men of Works Department	

(3095)

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(3095)

TABLE showing Repairs to Imperial Military Railways from Bloemfontein to Pretoria—(continued).

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Officer in Charge and Working Party.	Time of				Permanent or Semi-permanent Repairs.	By Whom carried out and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
612 Roodewal Station	Permanent way entirely destroyed for 1½ miles by blowing up alternate rail joints, thereby making large holes in formation level and rendering all rails useless. Pumper's house and water-tanks, mile 613-49, completely disappeared, only large hole where they had been. Following bridges in this piece also completely destroyed: Mile 613-4, one 50' 0" span, two 20' 0" spans. Mile 613-49, Rhenoſter River Bridge, one 100' 0" two 50' 0" spans. Mile 613-78, six 20' 0" spans; altogether the most complete damage to line yet done—bridges, permanent way, water supply, all destroyed	Made deviation alongside old alignment on lower level, thereby avoiding making bridges at 613-4 and at 613-78. Made bridge over Rhenoſter River; rail level above river bed, 31' 0". Timber baulks on crib piers; following spans, six of 19' 0" each. Length of deviation, 1,250 yards; maximum gradient, 1/60	Lieut. Micklem's Construction Party, detail as before. The party left at Zand River, having rejoined on 25.5.00. 1 Civilian Permanent Way Inspector and 19 Men Infantry details joined Lieut. Micklem on 27.5.00. 1 Officer, 23 N.C.O.'s and Men Devon and Somerset Vol. R.E. joined on 30.5.00; 1 Officer, 20 Men Cheshire Vol. R.E. joined. On 26.5.00, 1 R.E. Officer left to go ahead	9.30 A.M.	25.5.00	10 P.M.	30.5.00	Masonry rebuilt by contract. 50' 0" span mile 613-42 replaced by repaired 50' 0" span from Brandfort. 20' 0" spans repaired. 103' 0" span at Rhenoſter repaired, afterwards replaced by 100' 0" girders got from Selati Line. Two new 50' 0" spans erected at mile 613-78. Four new 30' 0" deck spans put in instead of the previous six 20' 0" spans	Carried out by E. Bromley, Esq., C.E., until his death, when A. W. Herbert, Esq., completed the work, with men of Works Department. Opened for traffic about 15.12.00	Morning, 25.5.00
614-23	Three 30' 0" spans, piers, abutments, girders, all destroyed	Replaced with timber on sleeper cribs	Advance party from Lieut. Micklem's Party completed most of these before arrival of Construction Train. Material supplied by ten wagons working from railhead	..	29.5 00	morning	31.5.00	Masonry rebuilt by contract. Three new 30' 0" deck spans erected	Carried out by E. Bromley, Esq., C.E. Opened for traffic 1.11.00	25.5.00



614-50	Three 9' 0" spans completely destroyed	do.	do.	..	do.	do.	do.	Masonry rebuilt. New girders put in	do.	do.
615-14	Two 9' 0" spans destroyed	do.	do.	..	do.	do.	do.	do.	do.	do.
615½ Kopjes Station	Three sets points and crossings destroyed	Replaced with new sets	..	do.	noon	31.5.00	9 A.M.	1.6.00	Masonry rebuilt by contract. Three new 30' 0" deck spans erected	Carried out by E. Bromley, Esq., C.E. Opened for traffic 20.12.00
618-75 Leeuwspruit Bridge	Three 30' 0" spans destroyed. Height of rail level above river bed, 15' 0"	Replaced with timber on sleeper cribs	Lieut. Micklem's party	..	do.	2 P.M.	11 P.M.	do.	Masonry rebuilt. New girders put in	do.
620-4	Double 9' 0" culvert destroyed, also 14 lengths rails pulled up	Culvert replaced with timber on sleeper crib piers. Permanent way repaired	Advance party from Lieut. Micklem's party	..	do.	..	..	..	do.	do.
620-70	Treble 9' 0" culvert destroyed	Replaced with timber..	do.	..	do.	..	..	..	do.	do.
621 Leeuwspruit Siding	Two sets points and crossings destroyed	Replaced with new sets	do.	..	do.	..	..	..	do.	do.
621-44	Treble 9' 0" culvert destroyed	Replaced with timber..	do.	..	do.	..	..	..	do.	do.
622-19	Double 20' 0" culvert destroyed	Replaced with timber on sleeper crib piers	Lieut. Micklem's party	11 A.M.	1.6.00	midnight	1.6.00	Masonry rebuilt by contract. Girders repaired	Carried out by E. Bromley, Esq., C.E.	265.00
627 Vrededorp Station	Five sets points and crossings, pump and water tank destroyed	Put in new sets	do.	midnight	..	6 P.M.	2.6.00	Masonry rebuilt. New girders put in	Carried out by Lieut. Pritchard, D.S.O., R.E. Commenced 22.1.01, completed 15.2.01	265.00
629-66	Single 9' 0" culvert destroyed, also 12 rail lengths permanent way	Replaced culvert with timber	do.	do.	..	do.	do.	do.	do.	do.
630 55	Treble 9' 0" culvert destroyed, and 11 rail lengths permanent way demolished	do.	do.	7 P.M.	2.6.00	5 P.M.	3.6.00	do.	Carried out by Lieut. Pritchard, D.S.O., R.E. Commenced 22.12.00, completed 28.1.01	265.00

TABLE showing Repairs to Imperial Military Railways from Bloemfontein to Pretoria—(continued).

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Officer in Charge and Working Party.	Time of				Permanent or Semi-permanent Repairs.	By Whom carried out and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
632-70	Treble 9' 0" culvert, 18 lengths permanent way destroyed	Replaced culvert with timber	Lieut. Micklem's party	6 A.M.	3.6.00	4.30 P.M.	3.6.00	Masonry rebuilt. New girders put in	Carried out by Lieut. Pritchard, D.S.O., R.E. Commenced 22.12.00, completed 26.1.01	26.5.00
633-59	Treble 9' 0" culvert, and 11 lengths permanent way destroyed	do. .	do.	do.	do.	do.	do.	do.	Carried out by Lieut. Pritchard, D.S.O., R.E. Commenced 3.12.00, completed 28.12.00	
634-45	Treble 9' 0" culvert destroyed	Replaced with timber on sleeper cribs	Lieut. Micklem's construction party	5 P.M.	do.	9 A.M.	5.6.00	do.	Carried out by Lieut. Pritchard, D.S.O., R.E., under direction of Capt. Waghorn, R.E. Commenced 11.8.00, completed 11.11.00	
634-54	Double 9' 0" culvert destroyed	do.	do.	do.	do.	do.	do.	do.	Carried out by Lieut. Pritchard, D.S.O., R.E., under direction of Capt. Waghorn, R.E. Commenced 11.8.00, completed 29.11.00	
634-65 Krommelen- borg Spruit Bridge	Two 50' 0" spans, abutments, pier, and girders thoroughly demolished	Replaced with timber on sleeper cribs. Considerable work removing wrecked girders	do.	do.	do.	do.	do.	Masonry rebuilt. New 50' 0" deck span erected	Carried out by Lieut. Pritchard, D.S.O., R.E., under direction of Capt. Waghorn, R.E. Commenced 25.8.00, completed 3.1.01	
637-9	One 30' 0" span destroyed	Replaced with timber on sleeper cribs	Lieut. Micklem's construction party	5 P.M.	3.6.00	9 A.M.	5.6.00	Masonry rebuilt, new 30' 0" through span put in	Commenced 7.12.00, completed 2.2.01	do.

637-52	Double 9' 0" culvert destroyed	do.	do.	do.	do.	do.	do.	Masonry rebuilt, put in ..	Commenced 12.11.00, completed 22.12.00
638-59	Double 20' 0" culvert ..	do	do.	do.	do.	do.	do.	Masonry rebuilt, one new span replaced with timber	Commenced 22.12.00, completed 21.1.01
639-64	Double 9' 0" culvert destroyed	do.	do.	do.	do.	do.	do.	Masonry rebuilt, new girders put in	Commenced 26.11.00, completed 28.1.01
643-0	Treble 9' 0" culvert destroyed	do.	10 A.M.	5.6.00	3 P.M.	do.	do.	do.	Carried out by Lieut. Pritchard, D.S.O., R.E. Commenced 23.10.00, completed 5.12.00
644-0 Wolvochoek Station	Seven sets points and crossings destroyed	Repaired two sets, enabling Construction Train to shunt on arrival and pass. Remainder repaired by party left behind for purpose	do.	do.	do.	do.	do.	..	do.
645-64	Treble 9' 0" culvert destroyed	Replaced with timber on sleeper cribs	do.	4 P.M.	2.30 A.M.	6.6.00	do.	do.	Carried out by Lieut. Pritchard. Commenced 27.9.00, completed 20.10.00
647-6	Four 9' 0" spans ..	do.	do.	..	11.5.00	5.10.00	do.	do.	Carried out by Lieut. Pritchard. Commenced 11.8.00, completed 5.10.00
651-3	Double 9' 0" destroyed ..	do.	do.	do.	do.	do.	do.	do.	Carried out by Lieut. Pritchard. Commenced 11.8.00, completed 26.9.00
654-38 Taibosch Bridge	Three spans 75' 0" each; two spans, 30' 0" each; maximum height rail level above river bed, 42' 3". Both abutments and all piers shattered to foundations. All girders badly damaged	Made high temporary bridge alongside destroyed permanent bridge, leaving sufficient room for repair later on. Necessitated deviation 530' 0" long. Temporary bridge about 6' 0" lower level than permanent, being 36' 6", high timber on sleeper crib piers, following spans, 15' 0", 14' 0", 14' 0", 20' 0", 20' 0", 20' 0", 19' 0", 18' 0"	do.	11 A.M.	6.6.00	9.6.00	noon	Masonry rebuilt by contract. All three 75' 0" spans repaired and re-erected. Two new 30' 0" deck spans put up	Lieut. Pritchard, D.S.O., R.E. Commenced 18.8.00, completed 23.12.00
658 Viljoen Drift Station	Seven sets points and crossings blown up, also watertank and pump	Replaced with new sets, four sets	By railway gangers, remainder by Lieut. Micklem's party	6 P.M.	9.6.00	10 P.M.	do.	..	..
									Bivouacked here night of 26.5.00
									27.5.00

TABLE showing Repairs to Imperial Military Railways from Bloemfontein to Pretoria—(continued).

Mileage.	Nature of Injury to Line.	Temporary Reconstruction.	Officer in charge and Working Party.	Time of				Permanent or Semi-permanent Repairs.	By Whom carried out and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
662 Vaal River Bridge, Verrening	Five spans, 37 metres each. Rails on top boom of girders, maximum height rail river bed, 62' 0". Water 10' 0" deep. Girders of span over deepest channel cut with dynamite and dropped one end in river, other leaning against pier slightly cracking it. Abutments and piers undamaged	Reconstruction previously made on construction, but very heavy excavation necessary in cuttings which had been silted up by floods, made low-level bridge partly with sleepers found at Viljoen's Station, partly with timber taken down from new pithead at colliery. All material had to be found in neighbourhood and brought to site by wagon, as no rail communication either north or south. Pulled up permanent way of portion main line not required and put it on deviation. Length deviation, 1 mile 300 yards; maximum gradient, 1/30; minimum curve, 500' 0' radius. Spans of bridge: 17 spans, 11' 0" each; also 5 spans, 10' 0" each; also 10' 6", 9' 0", 9' 0", 10' 6", 12' 0", 14' 0", 14' 0", 14' 0", 7' 9", 8' 6", 14' 6", 13' 6", 11' 0"	Capt. Travers, R.E., with C Pontoon Troop, R.E.; Lieut. Pritchard, R.E., with 300 Natives from colliery and 8 Civilian Plate-layers collected from railway and colliery. Working Party Infantry averaging 100. Lieut. Micklem's party assisted on arrival at 10 P.M., 9.6.00, until completion following morning	evening	27.5.00	midday	10.6.00	The gap made by the broken span closed by pulling over the four southern spans northward, thus leaving the shore span on south side open, which was then bridged with trestles and trussed beams.  Permanent repair: Damaged span removed from river, repaired, and re-erected in south shore span	Capt. Fisher, R.A., and two Cos. R.P.R. carried out semi-permanent repair and removed girders from river. Commenced 10.7.00, completed 31.8.00.  Permanent: Started by Lieut. Pritchard, R.E. Completed by Lieut. Frith, R.E. Commenced 27.12.00, completed 19.4.01	Crossed Vaal on 27.5.00

Line between Vaal River and Johannesburg undamaged. First through train from Bloemfontein reached Johannesburg on 10.6.00, ten days after Lord Roberts reached that place on 31.5.00. Repair of line from siding to Vaal River, 200 miles, completed in five and a half weeks.

Kilometre  
17  
Irene Bridge

(3095)

25-metre span. One masonry abutment completely demolished, the other badly shaken. Iron bowstring girders badly damaged	Details of this are unfortunately not obtainable	Major Jerome, R.E., 9th Field Co. R.E., and 100 Natives	..	3.6.00	..	Before 21.6.00, exact date not known	Converted into 100' 0" span, as waterway not sufficient. New masonry to suit larger span built by contract. New 100' 0" span erected, one of the spans intended for Selati Line and obtained by us	Capt. Fuller, R.E., partly with sappers, partly with men of Works Department. Commenced 1.9.00, opened for traffic on 8.1.00
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The line from Cape Town to Pretoria was open for traffic on the morning of 21.6.00.

Between the 7th and 9th June, 1900, Commandant De Wet made a raid along railway, which necessitated the following repairs. Rail communication having been opened with Johannesburg on 10.6.00, material was obtained from that place.

# VI.—TABLE showing Repairs to Military Imperial Railways necessitated by Commandant De Wet's Raid, June, 1900.

Temporary wood bridge, 50' 0" long, had been burnt by De Wet	Replaced it as before ..	..	Lieut. Micklem's Construction Party, assisted by Section Electric Light Co. R.E., under Capt. Lloyd, R.E.	8 A.M.	13.6.00	7 A.M.	13.6.00	See previous records of this bridge.
Temporary wood bridge, 30' 0" long, had been burnt by De Wet	do.	do.	do.	do.	do.	do.	do.	do.
Temporary wood bridge, 30' 0" long, had been burnt by De Wet	do.	do.	do.	do.	do.	do.	do.	do.
Temporary wood bridge at Lecuwspruit, 100' 0" long, 15' 0" high, had been burnt by De Wet	At 1.30 A.M. on 14.6.00, while on this bridge at work, the Construction Trains were attacked at close range by De Wet with 1,800 Men and 6 guns. Enemy got right up to train, drove working party off bridge, burnt it, capturing 1 Officer and 45 Men; remainder, about 120, succeeded in defending themselves, and holding trains till relieved at 4 A.M. Lieuts. Micklem and Holmes wounded, 3 Men killed 5 wounded, 3 Natives killed 25 wounded. All the 900 Natives bolted, but all returned during next few days except 300	In the morning, by order of Lord Kitchener, Construction Trains ran back to Vredefort and waited there all day, but on 15.6.00 received permission to proceed with repair of line, Lieut. Micklem having handed over to Lieut. Pritchard, D.S.O., R.E.	8 P.M.	do.	8 A.M.	16.6.00	do.	



TABLE showing Repairs to Imperial Military Railways necessitated by Commandant De Wet's Raid.

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Officer in Charge and Working Party.	Time of				Permanent or Semi-permanent Repairs.	By Whom carried out and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
615-14	Temporary wood bridge, 20' 0" long, burnt by De Wet	Replaced as before ..	Party taken over by Lieut. Pritchard, R.E., from Lieut. Micklem	9 A.M. Delayed owing to order that party must not work at night	16.6.00	9 P.M. Lord Kitchener's	18.6.00	See previous records of this bridge.		
614-50	Temporary wood bridge, 30' 0" long, burnt by De Wet	do.	do.	do.		do.	do.			
614-28	Temporary wood bridge, 100' 0" long, burnt by De Wet	do.	do.	do.		do.	do.			
613-49 Rhenoster River	Temporary wood bridge, 120' 0" long, 31' 0" high, burnt by De Wet	Replaced by trestle bridge ..	Capt. Waghorn, R.E., 1 Co. R.P.R., 60 Natives worked at bridge until arrival from North of Lieut. Pritchard's party (night of 18.6.00), who then finished it	6 A.M.	16.6.00	8 A.M.	21.6.00			
612 Roodeval Station	Station buildings and permanent way completely destroyed by fire and by explosion of truck load of 9-4" lyddite shells, which had been exploded by fire and blown enormous holes in the permanent way; whole place littered with debris and burnt stores	Permanent way repaired, debris cleared away	Advance party from Capt. Waghorn's party	Completed	while were in progress	repairs to bridges				
593-76 Hoening Spruit Bridge	One 50' 0" span, two 20' 0" spans. Pier demolished by De Wet, girders 50' 0" span partly damaged and one end dropped	Jacked up damaged girders, and bridged gap with timber	do.	5 A.M.	13.6.00	4.30 P.M.	13.6.00	do.	do.	

599-37	One 50' 0" span longitudinal sleeper partly burnt. Abutment partially damaged	Oribbed up girder, replaced longitudinal sleeper	Capt. Wagborn, R.E., 1 Co. R.P.R., 60 natives	5 A.M.	13.6.00	4.30 P.M.	13.6.00	
608-65	Double 9' 0" span destroyed	Replaced with timber ..	do.	do.	do.	do.	do.	See previous records of this bridge
608-23	Temporary wood bridge, 50' 0" long, burnt by De Wet	Replaced as before ..	do.	noon Delayed by standing to arms for a long time ready to resist. Threatened by enemy in close proximity	13.6.00	4 P.M.	15.6.00	
VII.—TABLE showing Repairs to Imperial Military Railways from Elandsfontein to Volksrust.								
Kilometre.	5-metre culvert abutments destroyed. Girders damaged	For temporary repairs see report on Natal Government Railways	..	..	..	..	..	Masonry rebuilt by contract. Girders repaired
143½	One 20-metre, two 15-metre spans. Both piers shattered	do.	..	..	..	..	..	Commenced 22.2.01, completed 23.3.01. Carried out by J. Wilson, C.E., District Engineer, Standerton
150½	5-metre culvert, east abutment destroyed. Girders damaged	do.	..	..	..	..	..	Commenced 5.1.01, completed 20.4.01. Carried out by J. Wilson, C.E., District Engineer, Standerton
156	5-metre culvert, east abutment shattered. Girders undamaged	do.	..	..	..	..	..	do.
162½	Top of west abutment damaged. Girders undamaged	do.	..	..	..	..	..	Masonry rebuilt by contract
182½	5-metre culvert, both abutments shattered. Girders undamaged	do.	..	..	..	..	..	do.
184½	do.	do.	..	..	..	..	..	Commenced 8.3.01, completed 16.3.01
219-13 from Natal Bor. der.	One 30-metre span. South abutment destroyed for a depth of 10' 0". Girders cut in two at 5th panel from south end with dynamite	Deviation 400 yards long made going over bridge on level 6' 0" lower than main bridge. Bridge made with eight cribs and three intermediate trestles; two cribs 22' 0" high, remainder from 8' 0" to 16' 0" high	Major Jerome, 9th Field Co. R.E.; 12 Pontoon Troop; 12 Infantry Platelayers; 150 Natives	..	26.6.00	..	..	Commenced 16.3.01, completed 27.3.01. Carried out by J. Wilson, C.E., District Engineer, Standerton
Bleabolspruit Bridge				..	..	..	..	Completed 6.3.01
				..	..	..	2.7.00	Lieut. Leith, R.E.; 19th Co. R.E. and 8th Co. R.E.; 4 Civilian Riveters; 4 Civilian Masons. Commenced 23.8.00, completed 13.10.00

TABLE showing Repairs to Imperial Military Railways from Elandsfontein to Volksrust—(continued).

Kilometre.	Nature of Damage to Line.	Temporary Reconstruction.	Officer in Charge and Working Party.	Time of				Permanent or Semi-permanent Repairs.	By Whom carried out and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
187-3 from Natal Border. Zuikerbosch Bridge	One 50-metre span, height from rail level to river bed about 40' 0", 12' 0" of water in river, 90' 0" wide. Both centre panels of girders destroyed. Girders dropped in river	Diversion made 900 yards long. Maximum gradient 1/30; curve 320' 0" radius. Low level bridge 240' 0" long on 14 trestles at 10' 0" interval, and eight cribs	Capt. Travers, R.E., Capt. Fuller, R.E., with C Pontoon Troop R.E.; 31st Co. R.E.; 250 Natives	4 P.M. Delayed	4.7.00 by attacks	5 P.M.	14.7.00 by the enemy	Undamaged portions of girders raised and repaired with new pieces	Lieut. Frith, R.E.; 40 N.C.O.'s and Men 8th Co. R.E.; 15 Infantry Details; 80 Natives; 15 Civilian Riveters. Commenced 27.8.00 completed 16.12.00	

On 26.7.00, Capt. Fuller's Construction Party met at Vlakfontein the Construction Party of the Natal Government Railways, who had repaired north, assisted by Pontoon Troop R.E., and 17th Field Co. R.E., thus opening the Line to Durban. For details of repairs by Natal Government Railways, see report on Natal Government Railways, pp. 115-128.

IX.—TABLE showing Repairs to Imperial Military Railways from Johannesburg to Klerksdorp.

197 Potchefstroom	Girder bridge, 10-metre span. Masonry damaged. Girder not displaced, but slightly damaged	Two sleeper cribs erected	Lieut. Vercoe (Assistant District Engineer); 11 Men (military), 25 Boys	..	17.11.00	..	18.11.00	Masonry repaired by day's work. Girder repaired	Lieut. Vercoe, 5 Men (civilian), 10 Boys. Commenced 14.1.00, completed 25.2.00	District occupied before construction began. First train 18.11.00
204½ Bruken Spruit	Girder bridge, 20-metre span. Masonry damaged and girder slightly damaged. Rails torn up 50 yards each side	Girder supported by trestles. Trestles supplanted by sleeper cribs later	do.	..	19.11.00	..	19.11.00	do.	Lieut. Vercoe, 5 Men (civilian), 10 Boys. Commenced 14.1.00, completed 28.2.00	District occupied before construction began. First train 19.11.00
208½ Machavie	Girder bridge, 20-metre span. Masonry damaged slightly. Girders displaced and slightly damaged. Rails torn up 100 yards each side	do.	do.	..	20.11.00	..	20.11.00	do.	Lieut. Vercoe, 5 Men (civilian), 10 Boys. Commenced 14.1.01, completed 5.3.01	District occupied before construction began. First train 20.11.00
209½	Girder bridge, 5-metre span. Girders slightly damaged, masonry badly	Girders supported by two sleeper cribs	Lieut. Vercoe (Assistant District Engineer). 11 Men (military), 130 Boys	..	21.11.00	..	21.11.00	do.	Lieut. Vercoe, 5 Men (civilian), 10 Boys. Commenced 14.1.00, completed 20.3.00	District occupied before construction began. First train 21.11.00



220 Koekamoos	Fish belly girder, two 20-metre spans. Centre pier demolished, centre ends of girders resting on ground, outer ends hanging on masonry. Girders damaged slightly. Height from bed of river, 16' 0"	Girder jacked up and supported by trestles at centre on foundation of pier, outer ends on cribs. Centre trestle was supplanted by cribs later, to allow masonry to be put in	do.	..	22.11.00	..	27.11.00	do.	Lieut. Vercoe, 5 Men (civilian), 10 Boys. Commenced 14.1.00, completed 30.4.00	District occupied before construction began. First train 27.11.00
108½ Bank Bridge 1st break	Girder bridge, two 5, and two 15-metre spans. Height from river bed to rail level 22' 0". Masonry of centre pier damaged slightly 4' 0" downwards, and girder displaced	Girder replaced .. ..	Major Blakeney and R.E. Co.	..	..	..	About 25.6.00	Masonry repaired permanently by day's work	Mr. Leyer, 3 Men, 60 Natives. Commenced Aug. 18, completed Aug. 20	First train passed 28.6.00
2nd break	Masonry of centre pier badly damaged 5' 0" down. Other piers slightly damaged. Girders hanging and badly damaged	Two 15-metre girders removed and replaced by baulks, carried by four trestles and sleeper crib, built on damaged central pier, sleeper and rail foundation for trestles, five spans 16' 4", one span 15' 4"	Lieut. Cusins, R.E. 17 Men, mostly military; 74 Natives	..	13.2.01	..	18.3.01	Masonry repaired by day's work. Girders being repaired	Lieut. Whitehouse, 3 Masons (civilian), 1 Mason (military), 12 Boys; 5 Riveters, 15 Boys. 6.3.01 not completed	First train passed 18.2.01
145 Welverdiend	Girder bridge, 5-metre span. Girders and masonry badly damaged. Height from river bed to rail 9' 6"	Two stringers, each 20' x 16" x 16", resting on two sleeper cribs	Capt. Buchanan. 5 Men (military), 60 Boys	..	26.7.00	..	28.7.00	do.	Lieut. Vercoe, 6 Men, R.E., 14 Natives. Began 14.1.01, finished 27.3.01	First train passed 28.7.00
164 Fredericksstad	Girder bridge, 15-metre span. Girders damaged and dropped 7' 0" on ruin of N. abutment. S. abutment slightly broken down at top. Bath cracked in places. Height from river bed to rail 20' 0"	3 trestles were put in supporting 12" x 12". Ground was soft, so 2 sleeper cribs were added, greatest span 10' 0"	Lieut. Vercoe, 11 Men (military), 54 Boys	..	29.10.00	..	3.11.00	do.	do.	First train passed 3.11.00
169 Buffelsvlei	Girder bridge, 15-metre span. Both abutments damaged. Girder down 3' 0" at one end, slightly damaged. Height from river bed to rail 25' 0"	Girder jacked up and 2 sleeper cribs put in	do.	..	4.11.00	..	5.11.00	do.	Lieut. Vercoe, 6 Men, R.E., 14 Natives. Began 14.1.01, finished 15.4.01	First train passed 5.11.00

X.—TABLE showing Repairs to Imperial Military Railways from Pretoria to Komati Poort.

Kilometres.	Nature of Damage to Line.	Temporary Reconstruction.	Officer in Charge and Working Party.	Time of				Permanent or Semi-permanent Repair.	By Whom carried out and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
408 Bronkhorst Spruit Bridge	Three 20-metre spans, one 10-metre span. Two piers absolutely demolished, abutments and one pier badly damaged. All girders destroyed. Height from rail level to bed of stream, 20' 0"	Made deviation and low-level trestle bridge alongside permanent bridge. Length of deviation, 660 yards; maximum gradient, 1/46 clear. Spans of bridge, 9' 7", 11' 10", 11' 9", 11' 5", 20' 0", 11' 1", 11' 6", 12' 10", 12' 5". Highest trestle, 13' 0"	Capt. Fuller, R.E.; 5 Officers and 140 N.C.O.'s and Men, R.E.; 20 Infantry Platelayers; 500 Natives	6 A.M.	25.7.00	midnight	27.7.00	Masonry rebuilt by contract. All girders repaired and erected	Capt. Travers and C Pontoon Troop, R.E., under Capt. Fuller's direction. Commenced 17.9.00, opened 3.1.01	
401	Two 4-metre masonry arches and one 5-metre span. One arch demolished. Girders destroyed	Replaced with timber ..	do.	7.30 A.M.	29.7.00	10 P.M.	29.7.00	Masonry rebuilt by contract. New span found in Pretoria erected	Capt. Fuller, R.E., with portion of 31st Co. R.E. and Civilian Masons	
400	do.	do.	do.	do.	do.	do.	do.	Masonry rebuilt by contract, girders by timber	do.	
400½	Permanent way destroyed for 15 rail lengths	Relaid permanent way								
408.5 Bronkhorst Spruit Station	Two sets points and crossings partly destroyed	Replaced with new sets								
393.8 Wilge River	One 30-metre span, two 10-metre spans. Abutments and piers demolished. Girders of 10-metre spans destroyed. Girders of 30-metre span cut in half and dropped into river. Water 10' 6" deep	Made deviation 660 yards long. Maximum gradient, 1/35. Erected low-level bridge following spans, 11' 0", 11' 0", 50' 0". In order to reduce width to be spanned down to 50' 0", it was necessary to throw large quantities of loose stone into river, 10' 6" deep close to banks, to make piers. The span was crossed by four trussel beams made up in Johannesburg and sent out	do.	10.30 P.M.	..	4 P.M.	3.8.00	Masonry rebuilt by contract. The 30-metre span repaired by replacing damaged portions with pieces from exactly similar span at Delagoa Bay belonging to Eastern Railway Company. One 10-metre span made up from the two damaged ones, the other replaced by trussel beam	Capt. Berry, R.P.R., and Lieut. Oakes, R.E., under direction of Capt. Fuller, R.E., with Men of 31st Co. R.E. and Civil Riveters and Masons. Commenced 20.9.00, completed 21.1.01	Army halted at Bal-moral and Middelberg, 1.8.00 to 24.8.00

203 Waterfall Onder Bridge	65' 0" clear span. Height above stream, 15' 0". West end of girders rendered unserviceable	Erected trestle bridge on same alignment as permanent bridge. Spans, 14' 7", 14' 3", 14' 6", 14' 9", 12' 11"	Lieut. Micklem, R.E.; 1 Officer, 42 Men, 42nd Co. R.E.; 1 Officer and 27 Men, 10th Co. R.E.; 1 Officer, 18 Men Devons; some Vol. R.E.; 30 Infantry details; 300 Natives with Gangers	..	4.9.00	9 A.M.	6.9.00	Cement grouted into stone foundations of trestles, and faced foundations with concrete  Permanent repair: Girders repaired with new pieces made Pretoria shops	O. Williams, Esq., Assistant District Engineer  Now in progress under A. F. Stewart, Esq., District Engineer, and G. Boyle, Construction Engineer	20.9.00
187 Nooitgedacht Station	Permanent way damaged..	Permanent way re-laid	do.							
169.5	2-metre culvert destroyed	Replaced with timber..	do.	6 A.M.	14.9.00	4 P.M.	16.9.00	Cement grouted into stone foundations of temporary trestles, and foundations faced with concrete. This lasted through wet season  Permanent repair: Masonry rebuilt by contract. Girders repaired with new pieces made in Pretoria shops	C. B. Williams, Esq., Assistant District Engineer  Now in progress under A. F. Stewart, District Engineer, and G. Boyle, Construction Engineer	
168.9 Godwan River Bridge	Two 65' 0" spans. Central pier destroyed and girders damaged and dropped. East span serviceable if lifted. West span useless. 8' 0" of water in river under west span. Height rail level to bed of river, 38' 0"	Some difficulty in removing and clearing west span. Put up three trestles between pier and west abutment, which were utilised. East span jacked up and supported with triple sleeper crib. Height above water level, 30' 0". Heavy work getting stone for dry rubble foundations	do.							
116.5 Nelspruit Station	Two rail lengths permanent way destroyed. 55 trucks damaged by an accident which occurred when enemy were working railway	Re-laid								
85 Krokodil P o o r t Bridge	Two 15-metre spans. Pier, and girders destroyed. Abutments undamaged. Deep kloof between two nearly vertical hills, approaches to bridge on side of steep slope. Precipice one side, vertical wall of rock the other	Necessary to lower men with ropes. Put sleeper crib on damaged pier and two other cribs, one in centre of each span, on rubble foundation. Spanned with timber following spans: Four of 22' 6" each in clear. Height rail level to bottom of kloof, 40' 0"	do.	9.30 A.M.	19.9.00	10 P.M.	21.9.00	Temporary crib piers replaced by five trestles on concrete foundations. This lasted through wet season  Permanent repair: Girders replaced with new 50' 0" deck span	Lieut. Cunningham, under direction Lieut. Micklem, with portion of 10th and 42nd Cos. R.E. Commenced 27.11.00, completed 12.12.00  Now in progress under A. F. Stewart, District Engineer, and G. Boyle, Construction Engineer	

TABLE showing Repairs to Imperial Military Railways from Pretoria to Komati Poort—(continued).

Kilometres.	Nature of Damage to Line.	Temporary Reconstruction.	Officer in Charge and Working Party.	Time of				Permanent or Semi-permanent Repairs.	By Whom carried out and Time Taken.	Date when Head-Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
93 Krokodil Poort Station	Found here 60,000 wood sleepers, quantities of cement and tools which came in very useful.									
75.5 Kaapmuiden Bridge	Three spans, 30 metres each, height above water level 55' 0". One pier destroyed, two spans of girders, ends near the pier resting on bed of river. Also an engine had been run down, and one span was smashed against pier in bed of river	Made a long deviation with low-level bridge, 330' 0" long, 21' 6" above water level; 16 timber spans on five trestles and 10 cribs. Spans as follows: 14' 6", 14' 3", 17' 6", 13' 8", 13' 3", 22' 0", 21' 10", 17' 5", 16' 9", 18' 0", 15' 8", 15' 4", 15' 8", 16' 0", 15' 8", 15' 2". Portion of bridge on curve, 400' 0" radius. Maximum gradient of approaches, 1/25	Lieut. Micklem's Working Party, detail as before. 200 Infantry working for 2 days	2 A.M.	22.9.00	9 A.M.	26.9.00	One span girder lifted and supported on trestle, remainder of bridge trestles on concrete foundations. Lasted wet season. Permanent repair: Masonry rebuilt by contract, one span being repaired, the other replaced by new one	Lieut. Micklem with portions of 10th and 42nd Cos. R.E. Commenced 12.12.00, completed 15.2.01	22.9.00
42	One 10-metre span, 30' 0" high. One abutment damaged. Girder one end demolished and fallen	Put up crib pier in middle and laid timber baulks across	Major Graham-Thomson, R.E., and 12th Field Co. R.E.	..	..	..	..	Crib pier replaced with two trestles on concrete foundation. Lasted wet season	Under direction Lieut. Micklem, portion 10th and 42nd Cos. R.E. Commenced 20.11.00, completed 30.11.00. Now being carried out by G. Boyle, under A. F. Stewart, District Engineer	
54.5 Malelane Bridge	One 20-metre span demolished	Boers had put up temporary bridge, which they left standing	.. .. .	..	..	..	..	Permanent repair: Rebuild masonry, erect new girder	Lieut. North, R.E., 10th and 42nd Cos. R.E. Commenced 1.11.00, completed 18.11.00.	

28 Hectorspruit Bridge	One 12-metre span, height 21' 0". Abutments both damaged, girders destroyed, and lying in bed of river	Stones piled in, among, and on top of debris of girders as foundation for two cribs. Timber laid across three 18' 0" spans. Foundation very shaky	Field Cos. R.E.	..	..	..	..	Without interrupting traffic put in three trestles on concrete foundation. Following spans: 9' 0", 18' 5", 18' 6", 8' 6", and then removed cabs. Very difficult work making footings for trestles, as damaged girders on which cribs rested and the loose stones foundation had to be removed without stopping traffic	Lieut. Cunningham, R.E., portions of 10th and 42nd Cos., R.E., under direction of Lieut. Micklem, R.E. Commenced 2.11.00, completed 25.11.00
29.5 Avoca Bridge	Four 31-metre spans. Three piers shattered; girders, ends of three spans demolished	Made deviation: Length, 1 mile 814 yards. Maximum gradient, 1/20. Minimum curve, 261' 0" radius. Low-level bridge, 15 spans, 11' 0" each, on sleeper cribs. Maximum height, 12' 4". This was made to get quantity of rolling stock off Barberton Branch. When this had been done with exception of two trains complete, then bridge was pulled up to avoid floods	Lieut. Micklem's party on arrival found most of earth work done by Major Hunter-Weston, R.E., with Field Troop R.E., and Infantry. Also foundations for cribs prepared. Work was delayed by traffic being blocked and material delayed	11 A.M.	28.9.00	..	2.10.00	Permanent repairs: Re-build masonry, repair girders	Now being carried out by Lieut. Frith, R.E., with 8th Co. R.E., and Civilian Artisans
								Permanent repairs: Re-build masonry, replace girders with new 50' 0" deck span	Now being carried out by G. Boyle, under District Engineer

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(3095)



XI.—TABLE showing Repairs to Imperial Military Railways from Pretoria to Pietersburg.

Kilometres.	Nature of Damage to Line.	Temporary Reconstruction.	Officer in Charge and Working Party.	Time of				Permanent or Semi-permanent Repairs.	By Whom carried out and Time Taken.	Date when Head Quarters of Army passed on the march.
				Arrival at Break.		Completion of Repairs.				
				Hour.	Date.	Hour.	Date.			
	3-metre culvert ..	Repaired with sleeper crib ..	Capt. Fuller, R.E., 30 N.C.O.'s and Men, 31st Co. R.E., 100 Natives	2 A.M.	20.8.00	5 A.M.	20.8.00			
	Nine pairs of rails blown up	Relaid with new rails ..	do.	6 A.M.	do.	9 A.M.	do.			
Ordered to return to Pretoria on 20.8.00										
	60 rail lengths blown up..	Relaid with new rails ..	Capt. Fuller, R.E., 90 N.C.O.'s and Men, 31st Co. R.E., 300 Natives	6 P.M.	22.8.00	11 A.M.	23.8.00			
Pietersburg Bridge	Six spans of 25 metres each. Three piers and one abutment damaged, two spans girders badly, and two spans slightly damaged	Made diversion 1 mile long, with low-level bridge 76' 0" long, on three trestles; spans 17' 6", 18' 0", 15' 0", 12' 6"	do.	noon	23.8.00	5 P.M.	28.8.00	Bridge reduced by two spans, slightly damaged girders repaired and launched forward. Masonry rebuilt. Shore spans filled in with rubble	Carried out by F. J. Dawson, Esq., District Engineer, under Capt. Fuller, with Men of Works Department. Commenced 26.9.00, completed 11.11.00	
No further damage up to Warm Baths, which remained Railhead until March, 1901										
On March 28th, 1901, Capt. Fuller's Construction Party proceeded to open the Line to Pietersburg. The Line to that place was only slightly damaged, and the Construction Train reached Pietersburg with the troops on April 9th, 1901										
51 8 Sept. Southern Line	Two 4-metre culverts and part of 35' 0" embankment washed away, Nov., 1900	A deviation, $\frac{1}{2}$ of a mile in length, had to be constructed. The Spruit is crossed by three spans of baulks, 18' 4", 19' 2", and 24' 9", resting on sleeper cribs	About 20 Whites and 350 Natives	..	2.12.00	..	8.12.00	..	5½ days	

## NATAL GOVERNMENT RAILWAYS.

## LIST OF PRINCIPAL DAMAGES TO PERMANENT WAY, BRIDGES, AND CULVERTS DUE TO ENEMY'S ACTION.

(3095)

## XII.—MAIN LINE.

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Working Party	Time of				Date when Army Head-Quarters passed.	Remarks.
				Arrival at Break.		Completion of Repairs.			
				Hour.	Date.	Hour.	Date.		
183 N. of High-lands	Rails torn up .. ..	Obtaining and replacing rails and sleepers	Natal Government Railways reconstruction	—	—	—	—	—	
148½ N. of Est-court	do.	do.	do.	—	—	—	—	—	
148½ .. ..	do.	do.	do.	—	—	—	—	—	
150 .. ..	do.	do.	do.	—	—	—	—	—	
Ennersdale Station	do.	do.	do.	—	—	—	—	—	
153½ .. ..	do.	do.	do.	—	—	—	—	—	
157½ .. ..	do.	do.	do.	—	—	—	—	—	
158½ .. ..	do.	do.	do.	—	—	—	—	—	
159½ .. ..	do.	do.	do.	—	—	—	—	—	
Frere Bridge, 160½	Two 100' spans destroyed by explosives. Pier and abutments undamaged	Deviation made along W. side of bridge, and trestle bridge 250' long by 15' high erected	Natal Government Railways..	10.15 A.M.	28.11.99	12 noon	6.12.99	12.12.99	Permanent Work.—Spans obtained from England, and completed on 6.6.00. Contract let on 17.3.00, to Michelson & Brand.
162 .. ..	Rails displaced by destruction of armoured train	Replaced .. ..	do.	—	—	—	27.11.99	—	

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Working Party.	Time of				Date when Army Head-Quarters passed.	Remarks.
				Arrival at Break.		Completion of Repairs.			
				Hour.	Date.	Hour.	Date.		
Between Freer and 163	Four breaks in road ..	Obtaining and replacing sleepers and rails	Natal Government Railways ..	8 A.M.	8.12.99	4 P.M.	8.12.99	12.12.99	
Culvert, 169½ ..	1C' rail decked destroyed by explosives. The abutments and decking damaged	Wreckage cleared and sleeper crib placed in the gap	—	9 A.M.	14.12.99	5 P.M.	14.12.99	20.2.00	
Between 169 and 172	Three breaks in road ..	Obtaining and replacing sleepers and rails	Military Working Parties from Irish Fusiliers, Inniskillings and Border Regiment	2.50 A.M. 4.30 P.M.	21.1.00 22.2.00	8.30 A.M. 6 P.M.	21.1.00 22.2.00	21.2.00 do.	
Colenso Bridge, 173½	Five 100' spans destroyed by explosives. One pier blown down	A deviation was made to W. of old bridge, and crossed river 100' above it. A bridge of 40 trestles 600' long and 30' high on concrete footings was erected	Natal Government Railways ..		21.2.00	7.45 A.M.	19.3.00	1.3.00	Permanent Work.—Spans obtained from England, and completed 5.8.00. Contract let on 27.3.00 to Messrs. Mitcheson & Brand.
173½ ..	Line pulled up 200' ..	Obtaining and replacing sleepers and rails	do.	—	—	—	1.3.00	—	
177 ..	Line pulled up ¾ mile ..	do.	do.	—	—	—	do.	—	
Culvert, 179½ ..	15' span destroyed by explosives. Abutments blown in	Wreckage cleared and three trestles 10' high placed in the gap	do.	—	5.3.00	—	8.3.00	—	Permanent Work.—Span obtained from England and completed 24.4.00. Departmental work.
Do. 179½ ..	20' span destroyed by explosives. Abutments blown in	do.	do.	—	do.	—	do.	—	Permanent Work.—Span obtained from England and completed 24.4.00. Departmental work.
Pieters Station, 180	Points damaged ..	Repaired ..	Natal Government Railway men from Ladysmith	—	—	—	6.3.00	—	
Davals Spruit Bridge, 182½	Two 20' spans destroyed by explosives. Abutment and pier damaged	Wreckage partly cleared and trestle bridge 12' high erected in gaps. The columns of centre pier were used again and also abutment. Two high-cut piles were made to replace northern one	do.	—	2.3.00	—	5.3.00	—	Permanent Work.—Masonry completed; awaiting spans from England.



184 to 185	Line pulled up $\frac{1}{4}$ mile ..	Obtaining and replacing sleepers and rails	do.	—	—	2.3.00	—	—	—
192 to 194	do.	do.	do.	—	—	10.3.00	—	—	—
Marais Spruit Bridge, 195½	Two 26' spans, about 100' apart, destroyed by explosives. Abutment damaged	Wreckage cleared and trestle bridges 16' high erected in the gaps	do.	—	9.3.00	13.3.00	—	—	Permanent Work.—Spans obtained from England and completed 28.10.00 Departmentally.
Culvert, 197½	20' span destroyed by explosion	Wreckage cleared and trestle bridge 12' high placed in the gap	do.	—	12.3.00	14.3.00	—	—	Permanent Work.—Span obtained from England and completed 6.5.00 Departmentally.
Culvert, 198	do.	do.	do.	—	do.	do.	—	—	do.
Modder Spruit Bridge, 199½	Three 40' spans destroyed by explosives	Deviation made along S. side of bank and small crib-work culvert made in centre	Natal Government Railway completed platelaying and bridge. 17th Company R.E.	—	14.3.00	17.3.00	—	—	Permanent Work.—Spans obtained from England and completed 22.7.00 Departmentally.
Spectacle Spruit Bridge, 201½	Three 15' spans destroyed by explosives. Abutments blown in	Wreckage cleared and trestle bridge 15' high erected	Natal Government Railway men	—	16.3.00	19.3.00	—	—	Permanent Work.—Spans obtained from England and completed 13.5.00. Contract let to Mr. G. W. Thomas.
Culvert, 203½	Two 12' 6" spans destroyed by explosives	Wreckage cleared, and trestle bridge 10' high placed in the gap	do.	—	17.3.00	do.	—	—	Spans from England were in the country. Contract, let to Mr. G. W. Thomas, is in hand.
Bridge at 205½	Six 12' 6" spans utterly destroyed by explosives. Piers and abutments blown down	Deviation made on N. side of bridge, and small trestle bridge made in centre of it	17th Company Royal Engineers and men from 4th Brigade	—	13.3.00	do.	—	—	—
Bridge, 206	Three 28' spans destroyed by explosives	Deviation made on N. side of bridge, and small sleeper bridge erected	17th Company Royal Engineers and men from 4th Brigade. Natal Government Railways finished platelaying	—	do.	23.3.00	—	—	Semi-permanent bridge completed 2.8.00.
Sundays River, 209	Four 60' spans. End of all the spans broken and twisted. Tops of piers and abutments damaged	Deviation was made along S. bank of line, and trestle bridge consisting of 13-15' trestles spanned the gap. Foundations partly cut out of the rock and partly concrete	17th and 37th Companies Royal Engineers made footings and blasted N. approach. Natal Government Railways built bridge, S. approach and plate-layed diversion	—	21.3.00	2.4.00	—	—	Permanent Work.—Spans obtained from England were already in the country. Contract completed 21.9.00 by Mr. G. W. Thomas.

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Working Party.	Time of				Date when Army Head-Quarters passed.	Remarks.
				Arrival at Break.		Completion of Repairs.			
				Hour.	Date.	Hour.	Date.		
213, culvert near Wessels Nek	Two 10' semicircular arches in 14' bank. Gaps in central pier, one 4' x 2', one 12' x 5', springing of arches damaged, and arches shaken. Holes blown in abutments, but damage not serious	Strutting arches through the gap with sleeper cribs crossed by balks, and wedged tight against the masonry	Natal Government Railways..	11.31 A.M.	15.5.00	4.45 P.M.	15.5.00	15.5.00	About 30 lbs. of dynamite was removed from the weepholes of the abutments. <i>Permanent Work</i> .—Completed 6.10.00.
215½ .. ..	9' culvert rail topped in 10' bank. Gap blown in centre between rails	The 12 rails blown out were replaced by others. Train passed without waiting for repairs	—	10.10 A.M.	16.5.00	10.45 A.M.	16.5.00	—	
216½ .. ..	15' girder bridge in 9' bank. A charge was placed on top of girders at two diagonally opposite corners. One girder and some of cross bracing was bent. The bed of one girder was shaken, and that of the other blown out. The decking was slightly damaged	A trestle was placed under span near where the bed had been blown out. The train passed without waiting for repairs.	—	10.50 A.M.	do.	11.15 A.M.	do.	—	
218, ¼ mile S. of Waaichbank Station	One 40' girder in 15' bank. Girder cut and dropped down. Abutments practically undamaged. Photo. No. 18	15' timber trestle bridge of three spans with ends resting on the abutment, was constructed over the gap	—	11.30 A.M.	do.	6.30 A.M.	17.5.00	15.5.00	30 lbs. of gelignite were found on S. abutment. <i>Permanent Work</i> . — Span obtained from England, and contract completed 21.10.00 by Micheson & Brand.
218½, Waaichbank Station	Three rail lengths beyond station point unfinished at one end and dragged sideways on to the veldt.	Rails unfinished and replaced	Natal Government Railways..	3 P.M.	do.	6 P.M.	16.5.00	16.5.00	
219½ .. ..	Eight rail lengths unfinished at one end, and dragged out on to the veldt, bending rails and fish-plates	Rails unfinished and replaced in position; three pairs of new rails inserted to replace those damaged	do.	5 P.M.	16.5.00	9.20 A.M.	17.5.00	—	

					9.30 A.M.	17.5.00	8 P.M.	20.5.00	First train, 8 P.M. 20.5.00	Permanent Work—Spans obtained from England and work is in hand.
220½	..	Two spans of 100 plate girders, 25' bank. Both abutments blown down level with the ground. Girders lay amidst wreckage, much broken and twisted. Site much encumbered with wreckage, some of the masses very large	Diversion made along N. side of bank, half cutting and half filling. A timber bridge, supported on 14 trestles, averaging 15' high and 15' centres, were erected. The end of trestles on both sides being close up against the abutments	37th Company Royal Engineers and Pontoon Troop made the footings for trestles and trimmed earthwork. Working parties from Middlesex, Dorset, and Lancashire Fusiliers removed the wreckage and did the earthwork. Natal Government Railways made and erected trestles and plate-laid the diversion	9.30 A.M.	17.5.00	8 P.M.	20.5.00	First train, 8 P.M. 20.5.00	Permanent Work—Spans obtained from England and work is in hand.
221	..	Two spans of 30' girders, 15' bank, centre pier wrecked, both abutments injured, and girders destroyed	Trestle bridge erected, four 15' trestles, 15' centres, end trestle close up against the abutments	Natal Government Railways made and erected trestles, and plate-laid gap. Infantry working parties helped to clear wreckage, made footings and carted sleepers and timber to site	7 A.M.	19.5.00	4 P.M.	21.5.00	—	Permanent Work in hand.
221½	..	Permanent way: 8 rail lengths destroyed by charges placed under fish-plates at alternate joints	Crippled rails replaced .. ..	Natal Government Railways ..	7 A.M.	20.5.00	4 P.M.	20.5.00	—	
221¾	..	10' rail-topped culvert in 5' bank totally destroyed	A timber bridge, with three 6' trestles, was placed in gap	Party of Pontoon Troop, Royal Engineers, made bridge, Natal Government Railways re-laid line. Timber had to be carted from the Waschbank River over very rough ground	—	18.5.00	—	21.5.00	Train crossed during night of 21.5.0	Culverts from mile 221¼ to mile 224½ were all prepared by soldiers and plate-laid when the construction train came along.
221½	..	10' skew brick arch in 16' bank, crown of arch blown in for about 10' along centre, leaving crater in middle of bank about 20' diameter at top	Timber bridge was built in gap resting on two 7' trestles over haunches of arch	Party of Pontoon Troop, Royal Engineers, made bridge, Natal Government Railways re-laid line. Timber, &c., ditto	—	18.5.00	—	21.5.00	do.	
221¾	..	9' rail-topped culvert in 6' bank, totally destroyed	Wreckage cleared and two sleeper cribs crossed by 12" x 12" timber. Stringers bridged the gap	Lancashire Fusiliers cleared wreckage, 37th Company Royal Engineers built bridge, Natal Government Railways re-laid line. Timber, &c., ditto	—	do.	—	do.	do.	
221¾	..	9' rail-topped culvert in 5' bank. Totally destroyed	Wreckage cleared, and rail-topped culvert with sleeper abutments placed in gap. Over top of culvert earth was filled up to formation level	Lancashire Fusiliers cleared wreckage, 37th Company Royal Engineers built bridge. Natal Government Railways re-laid the line	—	do.	—	do.	do.	Timber had to be carted from across the Waschbank River over very rough ground.

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Working Party.	Time of				Date when Army Head-Quarters passed.	Remarks.
				Arrival at Break.		Completion of Repairs.			
				Hour.	Date.	Hour.	Date.		
2221½ ..	9' rail-topped culvert in 5' bank. Totally destroyed.	Wreckage cleared, rails re-laid on stone supports, and then sleeper cribs on rails made up to formation level	Lancashire Fusiliers cleared wreckage. 37th Company Royal Engineers built bridge. Natal Government Railways re-laid the line	—	18.5.00	—	21.5.00	Train crossed during night of 21.5.00	
2222 ("5") ..	do.	Wreckage cleared, bridge built as follows :—With dry stone abutments, sleeper, bed plates, and three 12" x 12" road bearers under permanent way	Lancashire Fusiliers, Natal Government Railways	—	do.	—	22.5.00	do.	Timber had to be carted from across the Waschbank River over very rough ground.
2222½ ("7") ..	9' rail-topped culvert in 4' bank. Totally destroyed	Rails that were sticking out of wreckage removed. Gap was then filled in with boulders and brought up to formation level	Lancashire Fusiliers ..	—	do.	—	do.	do.	do.
2222½ ("8") ..	9' rail-topped culvert in 6' bank. Totally destroyed	Cleared as No. 7. Filled up half way with boulders and then brought up to level formation with sleeper cribbing	do.	—	do.	—	do.	—	do.
2222 ("9") ..	9' rail-topped culvert in 5' bank. Totally destroyed	Rails that were sticking out of wreckage removed. Gap was then filled in with boulders to formation level	do.	—	19.5.00	—	do.	—	do.
2222½ ("10") ..	do.	do.	do.	—	do.	afternoon	do.	—	—
222½ ("11") ..	9' rail-topped culvert in 7' bank. Totally destroyed	do.	do.	—	do.	—	do.	—	—
223 ("12") ..	5' rail-topped culvert in 7' bank. Totally destroyed	Rails that were sticking out of wreckage removed. Filled up half way with boulders and then brought up to formation level with sleeper cribbing	do.	—	do.	afternoon	do.	—	Sleepers carted across the Waschbank River over very rough ground.
223 ("13") ..	5' rail-topped culvert in 3' bank. Totally destroyed	do.	do.	—	do.	do.	do.	—	

222 ("14")	..	3' culvert in 4' bank. Totally destroyed	do.	do.	—	do.	—	—
223‡ ("15")	..	10' stone arch in 10' bank. Crown of arch blown in	do.	do.	—	do.	—	—
223‡ ("16")	..	5' rail-topped culvert in 4' bank. Totally destroyed	do.	do.	—	do.	—	—
223‡ ("17")	..	9' rail-topped culvert in 5' bank. Totally destroyed	do.	do.	—	do.	—	—
223‡ ("18")	..	9' rail-topped culvert in 6' bank. Totally destroyed	do.	do.	—	do.	—	—
223‡ ("19")	..	5' rail-topped culvert in 3' bank. Totally destroyed	do.	do.	—	do.	afternoon	—
223‡ ("20")	..	9' rail-topped culvert in 6' bank. Totally destroyed	do.	do.	—	do.	evening	—
223‡ ("21")	..	9' rail-topped culvert in 7' bank. Totally destroyed	do.	do.	—	do.	—	—
223‡ ("22")	..	9' rail top in 6' bank. Totally destroyed	do.	do.	—	20.5.00	—	Train passed over on night, 22.5.00
224 ("23")	..	9' rail top. Totally destroyed	do.	do.	—	do.	—	do.
224 ("24")	..	15' girder in 7' bank. Abutments blown up, span, complete, sticking in gap	Removed girder and built timber bridge with one 6' trestle	Lancashire Fusiliers and Natal Government Railways re-laid line	—	20.5.00	—	Train passed on morning of 23.5.00
224‡ ("25")	..	5' rail-topped culvert in 3' bank. Totally destroyed	Rails that were sticking out of wreckage removed. Gap was then filled up with boulders to formation level	do.	—	do.	—	do.
224‡ ("26")	..	15' girder in 9' bank. Abutments partially destroyed and girder dropped half-way down between them	Girder removed and gap filled with boulders	Royal Engineers and Lancashire Fusiliers, and Natal Government Railways re-laid the line	—	21.5.00	—	Train passed midday 23.5.00

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Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Working Party.	Time of				Date when Army Head Quarters passed.	Remarks.
				Arrival at Break.		Completion of Repairs.			
				Hour.	Date.	Hour.	Date.		
224½ ("27") ..	15' stone arch culvert in 20' bank. Crown of arch blown in almost along whole length	Sleeper cribs built over haunches. Four 12" x 12" stringers laid over them	37th Company Royal Engineers and Natal Government Railways	—	22.5.00	—	23.5.00	Train passed afternoon of 23.5.00	
224½ ("28") ..	do	do.	do.	—	do.	—	22.5.00	Train passed 4.45 P.M., 22.5.00	
230½ ..	Permanent-way sleepers removed from 2 rail lengths, evidently for firewood	Sleepers renewed .. ..	Natal Government Railways	4.30 P.M.	23.5.00	5.30 P.M.	23.5.00	—	All the platelaying up to here was done by Natal Government Railways
235½ ..	One 30' girder in 20' bank. N. abutment blown down. Charge on S. abutment failed to explode. Ends of girders damaged	Diversion with boulder causeway prepared by York and Lancaster Regiment. The unexploded charge (40 lbs. of dynamite) was drawn by Capt. von Hugel, Royal Engineers. The platelaying was done by Natal Government Railways, but the material from railway bank and at the gap, laid out ready for putting together by the York and Lancaster Regiment.	York and Lancashire Regiment and Natal Government Railways	7 A.M.	21.5.00	5.30 P.M.	24.5.00	—	The five gaps between Glencoe and Dannhauser Station (235½ miles to 241 miles) were under the supervision of Lieut.-Col. Sim, Royal Engineers. <i>Semi-permanent bridge</i> finished 11.7.00 <i>Departmentally</i>
236½ ..	One 15' girder in 12' bank. Both abutments blown in and span dropped between them	Diversion made by Middlesex Regiment, and rails and sleepers from each side of gap laid out along it ready to link in. Linking in done by the Natal Government Railways.	Middlesex Regiment and Natal Government Railways	8 A.M.	22.5.00	5.15 A.M.	25.5.00	—	<i>Semi-Permanent bridge</i> .—Completed 15.7.00 <i>Departmentally</i>
237½ ..	One 30' girder in 20' bank. Both abutments blown in, and span dropped and damaged.	Diversion made by Dublin Fusiliers by cutting along the W. side of bank. The gap was filled with a boulder causeway about 4' high, brought up to the requisite level by sleeper cribs. The Pontoon Troop trimmed off earthwork and platelayed most of the diversion, as well as assisting with the sleeper cribbing. What was left undone was completed by the Natal Government Railways.	Dublin Fusiliers Pontoon Troop, Royal Engineers and Natal Government Railways.	12.00.00	21.5.00	12.30 P.M.	do.	18.5.00	<i>Semi-Permanent Bridge</i> .—Completed on 17.7.00.

232]	..	..	Two 30' girders in 18' bank. S. abutment blown in, a span dropped and damaged. Pier undamaged but bored for charges. Charge behind N. abutment missed fire	A diversion was made along E. side bank crossing at the gap about 6' above the ground. This was made up by a stone causeway about 3½' high and 3' of cribbing. The earthwork and causeway were done by the Royal Lancashire Regiment. The cribbing by the Royal Engineers, who also laid the rails and sleepers from the bank along the deviation, and linked some of them in; Natal Government Railway completed what was left. Lieut.-Col. Sim drew the charge (50 lbs. of dynamite) from behind N. abutment.	37th Company Royal Engineers, Royal Lancashire Regiment and Natal Government Railways	8 A.M.	20.5.00	3.30 P.M.	25.5.00	18.5.00	Semi-Permanent Bridge.—Completed by the Department on 29.7.00.
241	..	..	Two 30' girders in 20' bank. Abutments blown in. Pier undamaged, but bored for charges. Girders dropped and damaged.	A diversion was made on E. side of bank, crossing at the gap at about 10' above ground level. This was made up by a stone causeway 4' high and 6' of cribbing. Earthwork and causeway were done by Royal Lancashire Regiment, as well as moving the rails and sleepers off the bank on to the deviation. The 37th Company Royal Engineers made the crib work till they ran out of sleepers, leaving about 2' in height still to be done. They also linked in some of the rails. The work was completed by the Natal Government Railway.	—	do.	do.	2 A.M.	26.5.00	do.	Semi-Permanent Bridge.—Completed by the Department on 28.7.00. Night shift started at 9.45 P.M., and finished at 2 A.M.
260], Ingagane River	..	..	Three 100' girders, 30' above river bed at centre. Both abutments blown in. End spans dropped and broken. Piers undamaged. Middle span cut and dropped	A deviation was made from Colly Siding on S. bank along the E. of the line crossing the river by a timber bridge of six trestles, the largest being 13' high.	Earthwork by military working parties. Plate-laying by Natal Government Railway	8 P.M.	23.5.00	8 A.M.	27.5.00	do.	The timbers for the bridge were taken from Waschbank River in wagons supplied by 5th Division. They left Waschbank on the night of the 21st and reached Ingagane River on the 23rd. Semi-Permanent Bridge.—Completed 6.10.00.
263	..	..	One 40' girder in 20' bank. S. abutment blown in. Girders damaged	Diversion carried along E. side of bank, crossing at gap by timber bridge of two trestles and one crib on a stone causeway.	Military working parties and 17th Company Royal Engineers, and remainder by Natal Government Railway	8 A.M.	25.5.00	5 A.M.	28.7.00	do.	Work delayed owing to construction engine running short of water. Permanent Work.—Span obtained from England and work is in hand. Contract let to Messrs. Clove Bros. & Roberts.



Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Working Party.	Time of				Date when Army Head-Quarters passed.	Remarks.
				Arrival at Break.		Completion of Repairs.			
				Hour.	Date.	Hour.	Date.		
2654	One 20' girder in 10' bank. Both abutments blown away and girders dropped and damaged	Wreckage removed by 17th Company Royal Engineers, timber bridge with two trestles and two small cr'work abutments placed in gap by Natal Government Railway	17th Company and Natal Government Railway	8 A.M.	25.5.00	3 P.M.	28.5.00	18.5.00	Work delayed owing to engine short of water. <i>Permanent Work.</i> —Similar to above.
2684	One 15' rail culvert in 15' bank. Totally destroyed	Wreckage removed and gap filled with boulders	17th Company .. ..	do.	23.5.00	8 P.M.	24.5.00	do.	<i>Permanent Bridge</i> —Completed 30.10.00. Contract let to Messrs. Anderson & Thomson.
2684, Incandu River	One 100' girder in centre and two side spans of 40' in 35' bank. Both abutments blown in. Both piers intact. Centre pier half cut through	A diversion 4,500' long was made S. and to the E. of these two bridges crossing Incandu River about 300 yards below the old bridge and the next donga about 100 yards further on. It joined the main line near mile 270. The Incandu River was crossed by a timber bridge of nine trestles about 15' high and the donga by three similar trestles, foundations of concrete.	37th Company Royal Engineers and Pontoon Troop did the earthwork, Natal Government Railways made the bridges and platelayed the diversion	8 P.M.	28.5.00	7.30 P.M.	3.6.00	8.6.00	Permanent bridges in hand.
2694	One 40' girder in 15' bank. Both abutments destroyed. Girder dropped and slightly damaged	—							
277, Donga Spruit	One 40' girder in 25' bank. Both abutments blown in. Girder dropped	An easy diversion was made along side W. side of bank and the gap crossed by a timber bridge of three trestles with sleeper cribs at either end forming the sill. Foundations made with layers of sleepers.	Pontoon Troop and 23rd Company Royal Engineers made diversion and made and erected bridge, Natal Government Railway did the platelaying	8 A.M.	5.6.00	9 A.M.	9.6.00	do.	Permission to mend the bridges beyond Newcastle was only obtained on June 3rd. <i>Permanent work</i> in hand.



794, Umbazane River	One 60' girder in 20' bank. Tops of both abutments blown in. Girder dropped about 10'	A pair of trestles were placed at either end of the bridge close to the abutments, and the girder jacked up to a height of about 8', sleeper cribs being used to pack it up, 2' of cribwork and long stringers were then placed on the girder and the road laid on them	Natal Government Railway ..	8 A.M.	5.6.00	10 A.M.	10.6.00	8.6.00	Natal Government Railway men were waggoned with material forward to here from Newcastle. <i>Permanent work in hand.</i>
2824, Ingogo River	One 100' girder in 32' bank. Both abutments destroyed. Girder cut and dropped	A diversion was made along E. bank of existing bridge, and the gap crossed by a bridge of seven spans 145' long. These included one 40' and one 30' strutted beam. A pile foundation was driven on the N. side and concrete slabs used for the remainder	do.	do.	do.	1.30 A.M.	14.6.00	do.	Natal Government Railway men and material waggoned forward to here from Douga Spruit.
287, Horseshoe Boscobella	Four 10' girders in 8' bank. Abutments destroyed, three piers damaged, 1st and 4th spans dropped, 2nd and 3rd spans cut	Wreckage cleared, piers built up again partly with sleepers; sleeper cribs made for abutments and stringers spanning gap	17th Company cleared wreckage, Natal Government Railway did timber work and plate-layed gap. Sleepers trollyed forward to here from Ingogo Bridge	do.	14.6.00	1.45 P.M.	do.	do.	<i>Permanent Work in hand.</i>
2954, Mount Prospect Station	One 30' girder in 20' bank. Abutments destroyed, and girder dropped	Diversion made alongside W. of bank, and the gap crossed by a timber bridge of 5 trestles	do.	9 A.M.	13.6.00	2 A.M.	17.6.00	do.	
2994, culvert	15' brick arch in 25' bank. Hole blown in arch about 4' long by 2' 6" wide	Diversion made to W. of gap. Sleeper cribs placed on haunches of arch, and stringers placed across opening	Pontoon Troop, Royal Engineers, cleared wreckage and made cribs. Natal Government Railway placed stringers across gap and plate-layed diversion. Sleepers carted forward to here from Mount Prospect	9.30 A.M.	16.6.00	4 P.M.	do.	do.	
303	Tunnel 730 yards long, with 18" stone lining. 50 yards of lining blown down at S. end, and 100 yards at N. end of tunnel. Face of N. end also blown in, carrying with it a large quantity of earth	Work started at all four ends of wreckage. Material placed along inside of tunnel in the side drains, and trollyed out from N. and S. ends, where lining was shaken and hanging loose it was strutted up with dry packing and timbers	17th Company Royal Engineers worked at N. end and Pontoon Troop at S. end during daytime. Natal Government Railway worked at both ends during night. Natal Government Railway men and material were waggoned forward to here from Mount Prospect	8 A.M.	14.6.00	2.30 P.M.	18.6.00	do.	<i>Permanent Work in hand. Contract let to Mr. G. W. Thomas.</i>

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Working Party.	Time of				Date when Army Head-Quarters passed.	Remarks.
				Arrival of Break.		Completion of Repairs.			
				Hour.	Date.	Hour.	Date.		
300½ .. ..	Permanent way, 500 yards of sleepers and large quantity of fish-plates removed. Rails left in site	Relaid line .. ..	Natal Government Railway. Sleepers were waggoned to gap from Volksrust and Mount Prospect	8 A.M.	15.6.00	3 P.M.	18.6.00	8.6.00	

## ORANGE RIVER COLONY BRANCH.

193½ and 196 ..	Three rail lengths at each place removed	Repaired .. ..	—	—	—	—	12.3.00 13.3.00	—	
215½, culvert ..	5' arch badly shaken ..	Temporarily restored sleeper cribs, ..	—	—	—	—	6.8.00	—	
218, culvert ..	9' corrugated deck blown up	Temporarily restored timber trestles	—	—	—	—	do.	—	
221½, entering No. 3 Reverse	do.	do.	—	—	—	—	8.8.00	—	
221½, leaving No. 3 Reverse	Two 2' 6" culverts blown up	Temporarily restored timber stringers	—	—	—	—	6.8.00	—	
218½, Backwal Station	Switches removed ..	Temporarily restored .. ..	—	—	6.8.00	—	do.	—	
223½ .. ..	Sleepers removed for 500'	Replacing sleepers .. ..	—	—	—	—	9.8.00	—	

## DUNDEE BRANCH.

234½ .. ..	Double 40' bridge, super-structure and masonry damaged	Repaired .. ..	Natal Government Railways ..	—	—	—	21.5.00	—	Permanent Work completed, 30.10.00.
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## XII.—IN THE TRANSVAAL.

13, Sand Spruit Bridge	Single 164' girder. Junction of top boom with end standards shattered by shell fire	Two pairs of trestles erected under damaged joint, and wooden strut inserted to take thrust borne by the end standard	37th Company Royal Engineers and Natal Government Railways	8.30 A.M.	21.6.00	9 A.M.	23.6.00	21.6.00	Train crossed 9 A.M., 23.6.00
24.. ..	Stone arch culvert in 30' bank. Pit sunk from formation to crown with side galleries over the arch. Archway filled in with bags of rubbish	Hole filled in with bags of rubbish, and 1½ tons powder removed from neighbouring platelayer's cottage	Natal Government Railways ..	12.30 P.M.	23.6.00	1 P.M.	23.6.00	do.	Train passed at 1 P.M., 23.6.00
52½, Kroonmuis Station	Two closers removed, one on either side of the culvert at S. end of station. Heels of switches of all three pairs of points blown up.	Replaced rails and obtained fresh points from Stauderton	do.	6 P.M.	23.6.00	5.45 P.M.	24.6.00	22.6.00	The construction train was derailed here, and a party from East Surrey Regiment assisted in repairing the damage caused
52½ to 60	Nine closers removed from the line	Rails cut and closers replaced ..	do.	7.30 A.M.	25.6.00	12 noon	—	do.	
61, Vaal River Bridge, Stauderton	Centre span of 16½' and two side ones of 83' each on 40' piers. Centre span cut and dropped into the river	A deviation 1 mile long was made on the up-river side of the railway bridge, and two trestle bridges (one of four-teen spans and the other of three) were erected over the Vaal River and an adjoining donga. The larger bridge consisted of trestles about 12' high and 15' centres, and the smaller one had a central 30' and two side spans of 15' each, the train crossing the gap on the skew	The earth work was done by the regiments in the 2nd Brigade, supervised by the 17th Company Royal Engineers and Pontoon Troop, Royal Engineers. The Royal Engineers also platelayed most of the diversion, and made the footings for the bridges. The Natal Government Railways built the bridges and completed the platelaying	12 noon	25.6.00	5 P.M.	9.7.00	1.8.00	
86. . .	350 yds. of line torn up and thrown over the bank, acquiring several twists thereby	Line dragged back into position with oxen and packed up	17th Company Royal Engineers	2 P.M.	9.7.00	12 noon	11.7.00	—	
91, Groot Spruit Bridge	One 65' and two 50' spans. Ends of girders damaged by explosion	Trestles were placed under the ends of the girders	Natal Government Railways ..	do.	12.7.00	7 P.M.	14.7.00	—	
98, Greylingstad	350 yds. of line torn up and thrown over the bank	Rails unflashed and re-laid in position	17th Company Royal Engineers	—	3.7.00	—	6.7.00	—	

Mileage.	Nature of Damage to Line.	Temporary Reconstruction.	Working Party.	Time of				Date when Army Headquarters passed.	Remarks.
				Arrival at Break.		Completion of Repairs.			
				Hour.	Date.	Hour.	Date.		
98, Greylingstad Station	Girders of a 16' culvert at N. end of station pulled down and the abutments damaged. Car ran over the embankment into the gap, seven trucks in the station derailed, and two sets of points destroyed	Sleeper crib and and trestles placed in the gap. Trucks re-railed and points repaired	Natal Government Railways ..	—	5.7.00	—	10.7.00	—	
101 ..	700 yds. of line torn up and turned over	Rails unfinished and replaced in position	17th Company Royal Engineers	—	do.	—	9.7.00	—	
105 ..	400 yds. of line torn up and turned over	do.	do.	—	do.	—	do.	—	
107 ..	350 yds. of line torn up and turned over	do.	do.	—	do.	—	do.	—	
105½ ..	16' culvert. Iron work and abutments destroyed by explosion	Sleeper crib and trestle .. ..	Natal Government Railways ..	—	—	—	25.7.00	—	

## APPENDIX D.

TABLES showing interruptions to Railway Traffic due to the Enemy, from  
June 6th, 1900, to July 4th, 1901.

### CAPE GOVERNMENT RAILWAYS.

#### WESTERN SYSTEM.

RETURN, showing Breaks in the Lines owing to the action of the Enemy,  
from 1st June, 1900, to 28th June, 1901.

Locality.	Date of Break.	Description of Damage.
Level crossing at 486 miles 76 chains	22nd December, 1900	A Boer Commando blew up a 6-feet culvert which acts as a cattle ditch to the level crossing at 486 miles 76 chains. One rail girder was destroyed and the masonry required partly rebuilding. A rail with check rails in the level crossing was also blown out and had to be replaced with new rails.
587 miles 40 chains ..	16th November, 1900	5 24-feet and 5 21-feet 6-lbs. sec. rails torn up; 6 iron sleepers, 12 fish-plates and 16 bolts broken and damaged.
752 miles 6 chains to 757 miles 57½ chains	21st January, 1901 ..	2 24-feet and 2 21-feet 60-lbs. sec. rails blown up; 9 fish-plates, 22 fish-bolts, 4 iron sleepers, 1 wood sleeper, and 2 bed timbers destroyed or damaged.
751 miles 74½ chains..	23rd January, 1901..	1 24-feet 60-lbs. sec. rail torn up; 4 iron sleepers and 8 fish-bolts destroyed.
523 miles .. ..	17th February, 1901	4 24-feet 60-lbs. sec. rails torn up; 1 iron sleeper, 12 fish-plates, 24 fish-bolts destroyed or damaged.
532 miles, level cross- ing	25th February, 1901	Ballast walls badly shaken; 6 21-feet rails, 60-lbs. sec., broken; 4 wood sleepers, 8 fish-plates, 16 fish-bolts destroyed or damaged.
553¼ miles, level cross- ing	.. .. ..	1 8-feet timber shattered, 5 24-feet 60-lbs. sec. rails broken; 3 wood sleepers and fastenings destroyed or damaged.
429 miles 26 chains ..	27th April, 1901 ..	10 24-feet 60-lbs. sec. rails torn up; 18 iron sleepers and fastenings destroyed or damaged.
517 miles 50 chairs ..	18th December, 1900	12-feet culvert, ballast walls blown down, caps and abutments shaken, &c.
531½ miles .. ..	20th December, 1900	5 20-feet culvert, north abutment and two piers badly damaged; 3 girder ends blown off.
	25th February, 1901	Outside ends of 2 piers on east side blown off; 4 girders damaged.
Road ..	11th December, 1900	Goods shed destroyed by fire.

## MIDLAND SYSTEM.

RETURN showing Breaks in the Line owing to the action of the Enemy,  
from June 1st, 1900, to 4th June, 1901.

Locality.	Date of Break.	Description of Damage.
District No. 1 .. .. .	.. .. .	Nil.
District No. 2, 162 $\frac{3}{4}$ miles main line, near Mortimer	4th May, 1901 ..	Fish-plates removed and rails turned out of line at joint; engine, tender, and 1 bogie truck derailed; 4 trucks and 1 van burned (No. 21 Down train).
157 $\frac{1}{2}$ miles main line, near Drenman	9th May, 1901 ..	Road blown up, damaging 4—24-foot steel rails, 60-lbs. sec., and 3 wrought-iron transverse sleepers. Fencing also cut on both sides of line at this mileage.
District No. 3, line near Sherbourne	25th December, 1900	No. 27 Down train held up and burnt. No damage to road.
216 miles main line, near Taaibosch	11th February, 1901	Rail taken up, and No. 6 Up duplicate wrecked.
District No. 4, 252 miles Graaff Reinets line, entrance to Jacht Poort	23rd February, 1901	Fish-bolts removed, and 3 rails taken out.
255 miles Graaff Reinets line, near Roode Hoogte Station	23rd February, 1901	One pair rails bent.
Marais Siding ..	17th March, 1901 ..	Crossing destroyed.
230 $\frac{3}{4}$ miles Graaff Reinets line, south of Bethesda Road	26th March, 1901 ..	2 pairs rails blown up.

## RHODESIA SYSTEM.

RETURN showing Breaks in the Lines owing to the action of the Enemy,  
from 1st June, 1900, to 10th June, 1901.

Locality.	Date of Break.	Description of Damage.
777 miles .. ..	20th October, 1900 ..	5 telegraph poles broken, wires cut, and fish-bolts in 4 joints.
781 $\frac{3}{4}$ miles .. ..	2nd February, 1901..	2 rails taken out.

STATEMENT showing interruptions on the Imperial Military Railways due  
to the Enemy from June 6th, 1900.

Item.	Date.	Locality.	Nature of Interruption.
1	6.6.00	Roodeval .. ..	Line blown up and train wrecked.
2	13.6.00	S. of Kroonstad, 539½ miles	Cattle guard blown up; traffic not obstructed any length of time.
3	3.7.00	Greylingstad .. ..	350 yards of line destroyed.
4	3.7.00	Between Greylingstad and Vlaklaagte	1,450 yards of line destroyed.
5	16.7.00	Kilometres 270, Heidelberg line	Culvert blown up.
6	18.7.00	Near Vlakfontein ..	Permanent way and culvert destroyed.
7	19.7.00	Near Bank .. ..	4 lengths of line cut. Train captured and engine capsized and destroyed. Train staff taken prisoners.
8	21.7.00	Roodeval .. ..	Line blown up and train captured.
9	23.7.00	Honingspruit .. ..	Line cut, train captured and destroyed.
10	24.7.00	5 miles S. of Kraal ..	Line destroyed and telegraph wire cut down.
11	27.7.00	Bank .. ..	Slight damage to line.
12	28.7.00	588 miles, near America..	Rail joints blown up, two rails removed. Joints damaged in forty places.
13	28.7.00	588½ miles, Orange River Colony	Milestone placed across the rail. Little damage done.
14	30.7.00	Near Leeuwspruit ..	Line blown up.
15	30.7.00	Frederikstad .. ..	Train wrecked. Driver killed, 11 soldiers killed and 39 wounded.
16	31.7.00	Serfontein.. ..	Points blown up.
17	1.8.00	Heilbron line .. ..	Bridge damaged.
18	1.8.00	602¼ miles, Orange River Colony	Line blown up.
19	2.8.00	Holfontein .. ..	Line blown up. Train captured and destroyed. Line repaired by P.W.I. by 2.30 p.m. 17 new rails put in, and burnt trucks put in siding.
20	4.8.00	Serfontein.. ..	Points blown up.
21	7.8.00	2 miles N. of Wolvehoek	3 pairs of rails and end of small culvert destroyed.
22	8.8.00	602½ miles, Honingspruit	Line blown up. 13 rails and 30 sleepers, also 20 fish-plates destroyed.
23	10.8.00	Vredefort Road .. ..	Line blown up.
24	14.8.00	13½ miles, Heilbron Branch line	Masonry damaged, N. abutment, 30-feet span at Gottenburg.
25	14.8.00	Near Wolvehoek.. ..	Culvert damaged.
26	15.8.00	Witpoortje .. ..	Boers fired on trains
27	22.8.00	620 miles, Orange River Colony	Line blown up.

Item.	Date.	Locality.	Nature of Interruption.
28	23.8.00	Roodepoort .. ..	Line damaged.
29	27.8.00	620 $\frac{1}{2}$ miles, Orange River Colony	2 pairs of rails torn up.
30	31.8.00	3 miles from Klip River	Train derailed and destroyed.
31	1.9.00	Klip River and Vereeniging	Line torn up. Supply train captured, 15 trucks burnt, engine damaged, and 2 men killed.
32	2.9.00	Heideiberg and Stander-ton	Line cut.
33	2.9.00	N. of Holfontein .. ..	Line cut. Train captured and destroyed.
34	2.9.00	N. of America .. ..	Line blown up.
35	2.9.00	Near Heidelberg .. ..	Train fired on. Fireman killed and driver wounded.
36	3.9.00	S. of Heidelberg .. ..	Line blown up.
37	3.9.00	N. of Honingspruit ..	Line blown up. Communication restored 2.35 p.m.
38	3.9.00	Pietersburg Railway, 54 miles N. of Pretoria	Rails torn up. Train derailed. Engine badly damaged
39	3.9.00	8 miles S. of Warm Baths	Train derailed.
40	4.9.00	604 miles, Serfontein ..	Line blown up. Repaired by construction train in morning.
41	4.9.00	Near Honingspruit ..	Line cut. 12 rails and 9-feet culvert blown up. Line repaired by 11 a.m.
42	5.9.00	Bank and Welvediend ..	Line cut.
43	6.9.00	8 miles S. of Balmoral ..	Engine exploded charge of dynamite. Engine and 5 trucks derailed.
44	6.9.00	Honingspruit and Roode-val	Line blown up. 11 rails up. Line repaired 9.40 a.m.
45	7.9.00	Near Serfontein .. ..	Line blown up. 14 rails blown up. Line repaired 9 a.m.
46	16.9.00	630 miles, Vredefort ..	41 rails blown up and cribs of culverts burnt.
47	8.9.00	N. of Leeuwspruit ..	Culverts destroyed. Line repaired and traffic resumed 2.15 p.m., September 9th.
48	11.9.00	108 kilometres south of Bank station	Culvert blown up.
49	14.9.00	S. of Paardekop .. ..	(6 miles) S. of Paardekop line blown up. Little damage.
50	17.9.00	Leeuwspruit .. ..	Line blown up in 21 places. One culvert burning.
51	17.9.00	Meyerton .. ..	Hospital train detained by order of Commandant, owing to Boers column moving towards Vereeniging.
52	17.9.00	Leeuwspruit .. ..	Damage to line repaired. Traffic resumed 1.30 p.m.
53	17.9.00	Vereeniging .. ..	Telegraph line N. of Vereeniging broken down.
54	18.9.00	Holfontein .. ..	14 joints blown up, 4 miles S.



Item.	Date.	Locality.	Nature of Interruption.
55	20.9.00	Vredefort Road .. ..	Line cut, 3 miles N. of this station. Repaired by 11.30 a.m.
56	22.9.00	Elands River .. ..	Station attacked by Boers. Much damage done, telegraph wires cut. Line torn up in several places.
57	26.9.00	13½ miles, Heilbron line..	Crib burnt. Line repaired 1.0 a.m. Point removed, bottom corner of bridge destroyed.
58	29.9.00	Bank .. ..	Train attacked 7 miles beyond Bank and could not reach Welvedien.
59	1.10.00	641¾ miles, Wolvehoek ..	Line blown up. Culvert birdcaging burnt. Line open 11.0 a.m.
60	1.10.00	Near Pan .. ..	Boers fired and wrecked 26 Up train.
61	2.10.00	Krumelberg and Wolverton	Line slightly damaged.
62	4.10.00	Kilometres 143½ .. ..	Culvert blown up 2 miles below Grootspuit. One girder dropped about 2 feet.
63	4.10.00	Val and Grootspuit ..	Iron girder culvert blown up. Masonry on S. side blown away and girder split. Rails all right.
64	6.10.00	Brugspruit .. ..	Engine of 24 Up blown off road by dynamite between Belfast and Balmoral. Engine derailed and slightly damaged. No one hurt.
65	6.10.00	494½ miles, Eensgevonden	Culvert line and telegraph blown up. Repaired in two hours.
66	8.10.00	Meyerton and Klip River	Traffic stopped during the day, as 40 Boers were reported on the line.
67	9.10.00	Heidelberg and Greylingstad	All trains stopped until further notice.
68	10.10.00	Klip River .. ..	103 and 105 Down trains detained at Klip River, owing to Boers being between there and Meyerton.
69	10.10.00	N. of Vlakfontein ..	Culvert blown up S.E. line at kilometres 182-524. Up train with Natal Government Railways passengers detained at Vlakfontein. Engine of same and one truck left at 3 p.m. with small escort of Rifle Brigade to gain information as to extent of damage, but were surrounded by Boers. Guard killed, driver wounded, fireman taken prisoner.
70	10.10.00	296 miles .. ..	Line at Bethulie destroyed by Boers.
71	11.10.00	554 miles, near Holfontein	17 explosions. 2 miles permanent way damaged.
72	12.10.00	Vlaklaagte .. ..	Line blown up. Repaired 10 a.m.
73	12.10.00	Ventersburg Road ..	Line blown up at 555 miles. Permanent way ¾ mile. Two miles of telegraph line and poles removed.
74	13.10.00	Paardekop .. ..	Line pulled up at kilometres 55.
75	13.10.00	Greylingstad .. ..	Line damaged and all wires cut this side of Val station. Railway Staff Officer says 400 yards of line torn up.
76	14.10.00	Vlakfontein .. ..	Culvert repaired, traffic resumed Greylingstad and Heidelberg.
77	15.10.00	Kruger's Siding .. ..	Line at or near blown up. Time repaired 9 a.m.

Item.	Date.	Locality.	Nature of Interruption.
78	16.10.00	Platrand .. ..	Line between Platrand and Paardekop blown up.
79	16.10.00	55 kilometres .. ..	Line turned over for 590 yards; 60 rails turned over. Clear 5.15 p.m.
80	17.10.00	Winburg .. ..	Culverts and rails blown up.
81	17.10.00	Vlakfontein, 182½ kilometres	Culverts, abutments, masonry, blown up. Engine riddled. Repaired 6 p.m.
82	18.10.00	75 kilometres, Platrand ..	Line broken, but repaired immediately.
83	21.10.00	Bethulie .. ..	Line broken up, Bethulie Branch.
84	22.10.00	Kruger's .. ..	Line broken up, 392¼ miles.
85	23.10.00	Bank .. ..	Line blown up, and telegraph lines cut at 103½ kilometres.
86	24.10.00	Ventersburg Road ..	Damage to telegraph. Five explosions, 10 rails put in. 1½ miles telegraph line and 40 poles down.
87	25.10.00	Edenburg .. ..	Train attacked by Boers and line blown up. Clear 11.0 a.m.
88	27.10.00	Ventersburg Road ..	Mail train attacked by Boers near Holfontein. Mails for Pretoria and several packages destroyed or stolen.
89	27.10.00	375½ miles, Jagersfontein Road	Line blown up. Culvert destroyed.
90	28.10.00	Virginia .. ..	9 culverts blown up near Virginia.
91	28.10.00	365¾ miles, Springfontein	Line blown up, permanent way torn up, telegraph cut.
92	28.10.00	392¼ miles, Pompei ..	Line blown up. 11 rails, 15 sleepers damaged.
93	31.10.00	419¾ miles, near Hertzberg	Line blown up.
94	1.11.00	423 miles, S. Kaffir River	Line blown up 31.10.00 and again 1.11.00. Damage, 39 rails, 79 sleepers, plates and bolts.
95	4.11.00	58 kilometres and 65 kilometres	Attempts to damage line, but not much harm done. Telegraph and fences cut.
96	5.11.00	57 kilometres, near Platrand	Line torn up, 55 pairs rails carried away, whole put back. Line clear 4.0 p.m.
97	6.11.00	425 miles, Kaffir River ..	Line blown up at noon. Replaced 8.0 p.m.
98	6.11.00	434 miles, Bickersfontein	Line blown up. 15 rails destroyed. Repaired by 8.0 a.m.
99	6.11.00	170 kilometres, Vlakfontein	Line torn up by Boers. 12 hours to repair.
100	10.11.00	251 kilometres, Rietvlee ..	350 yards line turned over on curve. Replaced by 3.50 p.m.
101	12.11.00	435 miles, Kaapspruit ..	7 rails blown up.
102	13.11.00	520 miles, Theron ..	12 rails blown up.
103	13.11.00	390 miles, Kruger's ..	Line blown up. 20 explosions.
104	14.11.00	389 miles, Pompei ..	Line blown up. 10 explosions. 43 rails, 50 sleepers damaged. Line repaired in two hours.
105	15.11.00	371¼ miles, Kuilfontein ..	Line blown up. 16 rails destroyed. Clear by 11.0 o'clock.

Item.	Date.	Locality.	Nature of Interruption.
106	15.11.00	393½ miles, Pompei ..	Boers tried to blow up line by digging holes and charging with compressed gunpowder.
107	17.11.00	364½, 375½, 376 miles, Springfontein – Jagersfontein	Line broken up by Boers. 47 rails and 56 sleepers damaged. Telegraph down.
108	18.11.00	365½ miles, Springfontein	No. 3 Down ran over dynamite having cap attached; exploded it, blowing out pieces of 30-inch, also sand-pipe broke cab windows. Driver got his train over by ramps.
109	19.11.00	Bronkhorst Spruit to Balmoral	Line broken in four places.
110	19.11.00	Balmoral, kilometres 391 and kilometres 376	2 rails blown up. Repaired by P.W.I. 2 rails dislodged at kilometres 376.
111	20.11.00	396 miles, Pompei.. ..	Line blown up. 2 rails, 2 sleepers, and N. abutment of culvert badly shaken. Repaired in 30 minutes.
112	21.11.00	Springfontein .. ..	15 pairs rails, 140 yards long, damaged. Repaired by 10 a.m.
113	21.11.00	Kuifontein .. ..	Kilometres 375½, 1 24-foot rail, 37 iron sleepers, 24 fish-plates, 28 fish-bolts, 2 wood sleepers blown up.
114	21.11.00	Providence .. ..	Kilometres 301 and 301½, 35 30-foot rails, 4 wood sleepers, 157 iron sleepers, 34 fish-plates, 28 fish-bolts, 16 dogs, 6 telegraph poles damaged and wires done.
115	21.11.00	Jagersfontein Road ..	375 miles, 2 24-foot rails, 41 iron sleepers, 12 pairs fish-plates, 40 bolts, and ½ mile telegraph wire down. Blown up by Boers.
116	22.11.00	Kilometres 215, S.W. line	1 closure rail, 12 feet long, gone.
117	22.11.00	Kilometres 216½, Do.	1 closure rail, 13 feet long, gone.
118	22.11.00	Kilometres 220, Do.	Middle pier of double 20-metre span bridge demolished. Girders almost wholly uninjured.
119	23.11.00	Kilometres 223, Do.	120 yards track, rails bent and torn out 170 yards. One side rails bent at right angles in middle, 40 yards rails gone, and 70 sleepers burnt up.
120	23.11.00	Kuifontein, 371½ ..	20 24-foot rails, 67 iron sleepers, 2 wood sleepers, 64 fish plates, 120 fish-bolts blown up.
121	27.11.00	Kruger's, 388½ miles ..	23 24-foot rails, 20 iron sleepers, 40 fish-plates, and 50 fish-bolts blown up.
122	27.11.00	Pompe, 392½ miles ..	11 24-foot rails, 20 iron sleepers, 24 fish-plates, 48 fish-bolts blown up.
123	29.11.00	Pompe, 393 miles.. ..	36 24-foot rails, 40 iron sleepers, 40 fish-plates, 40 fish-bolts blown up.
124	30.11.00	Near Hertzberg, 417½ miles	1 24-foot rail, 4 wood sleepers, 4 fish-plates, 8 fish-bolts, both abutments of culvert No. 199 shaken by explosion.
125	5.12.00	Kilometres 296 .. ..	120 yards road blown up.
126	6.12.00	Kilometres 302 .. ..	1 rail destroyed, 7 trucks of construction train derailed.
127	6.12.00	Kilometres 302 .. ..	50 yards road blown up, 7 trucks of construction train derailed.

Item.	Date.	Locality.	Nature of Interruption.
128	7.12.00	Kilometres 123 .. ..	30 yards of rail twisted, 19 Down special (3 a.m., 8th December) engine overturned, and 5 trucks derailed, burnt and smashed, caused by Boers removing 1 rail.
129	7.12.00	Kilometres 118, Vlaklaagte	2 pairs rails pulled out, 4 trains held up, 130 horses taken away from No. 520 train, and driver James wounded.
130	7.12.00	Kilometres 234, Rietvlei	531 down train derailed at bridge three miles north of station.
131	8.12.00	Kilometres 116, near Vlaklaagte	2 pairs rails taken out by Boers.
132	13.12.00	Kilometres 116, near Vlaklaagte	Boers loosened fastenings of 1 pair rails, causing derailment of 4 trucks.
133	13.12.00	Kilometres 61, Platrand..	1 rail pulled out, 3 trucks derailed of No. 520 train.
134	18.12.00	5 miles east Klerksdorp..	3 trucks derailed, 3 rails ripped up by Boers taking up one pair fish-plates.
135	20.12.00	Kilometres 304½ .. ..	Explosion. Derailment of engine and trucks, permanent way damaged.
136	24.12.00	Kilometres 330 and 334½	Explosion. Rails and joints blown out.
137	26.12.00	Kilometres 304·8.. ..	3 rails damaged, train No. 11 blown up and burnt by enemy. 1 man killed and 5 wounded.
138	28.12.00	Kilometres 181 .. ..	2 rails unfastened and thrown on one side.
139	28.12.00	Kilometres 405 west of Pam	Line blown up. 400 yards destroyed, and wires cut.
140	29.12.00	Kilometres 305-305½ ..	640 yards permanent way lifted and thrown over bank into sluit.
141	29.12.00	Kilometres 172½, Godwan River	Screws and splice bolts removed by Boers.
142	29.12.00	Kilometres 142½, between Val and Greylingstad	Train derailed, due to Boers taking up one rail on low side of curve. 7 trucks burnt.
143	29.12.00	Kilometres 140·5.. ..	1 rail removed by Boers.
144	30.12.00	Pompi, 393 miles ..	1 24-foot rail and 4 fish-bolts broken by explosion.
145	31.12.00	639 miles 60 chains, and 640 miles, Orange River Colony	4 30-foot rails destroyed; 2 wood sleepers, 1 pair fish-plates, 20 fish-bolts, 10 dogs blown up.
146	1.1.01	603 miles 5 chains, Orange River Colony	3 30-foot 60-lbs. rails, 1 24-foot 45-lbs. rail, 4 iron sleepers, 12 fish-bolts, and 2 fish-plates blown up.
147	3.1.01	629¾ miles, Orange River Colony	6 iron sleepers, 3 wooden sleepers, 4 30-foot rails, 6 fish-plates, 8 fish-bolts, and 1 9-foot culvert blown up.
148	7.1.01	Pan .. ..	470 yards line torn up and overturned. Culvert at 294 kilometres, shaken, and bed stone cracked.
149	7.1.01	Kilometres 216 .. ..	1 rail badly damaged and removed, with fastenings.
150	8.1.01	Kilometres 372 .. ..	2 fish-plates taken off and 1 rail pulled out by hand.

Item.	Date.	Locality.	Nature of Interruption.
151	9.1.01	Kilometres 295 and 370 $\frac{3}{4}$	500 yards rail removed by explosion. Engine and trucks derailed.
152	11.1.01	Kilometres 72, S.W. line	Line blown up and culvert slightly damaged. 6 rails and 4 sleepers destroyed.
153	12.1.01	Kilometres 40 $\frac{1}{2}$ , near Kaapmuiden	4 lengths of Cape rails and iron girder of 5-metre culvert damaged by Boers.
154	12.1.01	Kaalfontein station ..	Station attacked and culvert at 40 $\frac{1}{2}$ kilometres damaged.
155	17.1.01	Kilometres 370 .. ..	3 trains derailed by explosion.
156	22.1.01	Kilometres 143.5.. ..	Culvert blown up.
157	23.1.01	555 miles, Orange River Colony	10 30-foot rails, 86 iron sleepers, 22 fish-plates, 52 fish-bolts blown up.
158	25.1.01	Kilometres 334 .. ..	Explosion. 2 rails blown up.
159	25.1.01	Uitkyk station .. ..	Facing points disconnected by enemy.
160	27.1.01	Wierburg branch.. ..	Line blown up between 3 and 4 cottages.
161	29.1.01	Half mile E. of Schaaprust Springs line	4 rails torn up by Boers.
162	1.2.01	Kilometre 304 and 305 W. of Pan.	2 lengths rails displaced, and joint sleepers shattered by explosion.
163	1.2.01	Near Serfontein 606 miles	8 30-foot rails 15 iron sleepers, 16 fish-plates, and 40 fish-bolts blown up.
164	2.2.01	Kilometres 304 .. ..	3 rails blown up.
165	2.2.01	Kilometres 115, near Meyerton	Line blown up. 1 engine, 2 hospital coaches, 10 trucks, and van derailed.
166	5.2.01	395 $\frac{1}{2}$ miles .. ..	17 24-foot rails, 40 iron sleepers, 33 fish-plates, 50 fish-bolts blown up.
167	5.2.01	393 $\frac{1}{2}$ miles, Orange River Colony	4 24-foot rails, 4 wood sleepers, 8 fish-plates, 10 fish-bolts, 2 iron sleepers, and masonry badly shaken.
168	5.2.01	Kilometres 149 $\frac{1}{2}$ .. ..	3 pairs rails torn up by Boers.
169	6.2.01	Kilometres 195 $\frac{1}{2}$ .. ..	Line blown up.
170	6.2.01	393 $\frac{1}{2}$ miles, near Pompei..	Explosion. 4 rails, 4 sleepers, 8 fish-plates, 10 fish-bolts, and 2 iron sleepers broken.
171	6.2.01	Kilometres 150, S.E. line	30 rails pulled up and wires cut.
172	6.2.01	Kilometres 174, Vlakfontein	Rail broken in two by explosion. Engine of mail train damaged, 9 men wounded.
173	7.2.01	Kilometres 114 .. ..	Train blown up.
174	8.2.01	Kilometres 126 $\frac{1}{2}$ .. ..	Train blown up.
175	8.2.01	373 $\frac{1}{2}$ miles, Orange River Colony	2 24-foot rails damaged by explosion.
176	9.2.01	374 $\frac{1}{2}$ miles, near Kuilfontein	Line blown up.
177	10.2.01	Kilometres 333 .. ..	1 rail blown out, trolley damaged.
178	13.2.01	Kilometres 180 $\frac{1}{2}$ .. ..	Pilot train blown up.
179	13.2.01	Kilometres 119 $\frac{1}{2}$ , Bank bridge	Pier and centre ends, girders of bridge blown up.

Item.	Date.	Locality.	Nature of Interruption.
180	13.2.01	Kilometres 150 $\frac{3}{4}$ , 3 miles E. of Grootspuit	Culvert blown up.
181	14.2.01	Kilometres 370 $\frac{1}{2}$ , Orange River Colony	1 rail and 4 sleepers damaged by explosion.
182	15.2.01	Kilometres 332 .. ..	2 rails blown out by explosion.
183	15.2.01	Kilometres 365, Brugspruit	Boers fired on trolley, damaging same and wounding 2 boys.
184	18.2.01	Kilometres 82, between Natal Spruit and Klip Rivor	Line blown up. Engine and tender overthrown, 5 trucks derailed, 4 pairs rails torn up.
185	19.2.01	Kilometres 370 .. ..	1 engine and 3 trucks derailed, permanent way damaged 50 yards, 18 rails and fittings blown out.
186	20.2.01	Kilometres 197 $\frac{1}{2}$ .. ..	Line blown up.
187	20.2.01	Kilometres 193.5 Kraal..	Mail derailed by Boers, 1 rail damaged.
188	22.2.01	Kilometres 115, between Meyerton and Vereeniging	Line blown up. 1 engine, 2 hospital coaches, 10 trucks and van derailed, 4 pairs rails torn up.
189	23.2.01	Kilometres 332 .. ..	Permanent way damaged. 1 engine and 4 trucks derailed by explosion.
190	24.2.01	Kilometres 193 $\frac{1}{2}$ .. ..	Line blown up.
191	27.2.01	Silverton siding .. ..	Key bolt taken out of facing points.
192	7.3.01	Kilometres 214, Heidelberg	Rail truck damaged by explosion.
193	10.3.01	Kilometres 266 .. ..	Engine No. 84 (10 Up train) and 4 trucks derailed by dynamite.
194	10.3.01	Kilometres 266 .. ..	Line destroyed in two places. 4 lengths of rails destroyed and 2 rails bent at joint.
195	11.3.01	Near Wilge River station	1 truck on No. 3 Down train damaged by explosion. On getting same clear a second mine exploded. Boers fired on train killing 3 men and 7 natives and wounding 2 men.
196	14.3.01	19 to 21 miles, between Gottenburg Halt and Leenwpoort	Line damaged by enemy. 3 culverts blown up, wires cut and poles blown down.
197	15.3.01	Kilometres 123, Vlaklaagte	Explosion. 3 feet blown out of one rail.
198	22.3.01	Kilometres 290 $\frac{3}{4}$ .. ..	3 rails blown out, 35 sleepers torn up and 60 chairs damaged by dynamite.
199	22.3.01	Kilometres 125 .. ..	No. 524 Up train blown up. 5 feet of one rail blown out and 5 Natal bogies overturned down bank.
200	22.3.01	3 miles E. of Pan .. ..	First Down special blown up and attacked. 4 trucks derailed, 2 soldiers killed.
201	22.3.01	618 miles .. ..	3 joints blown up. Damage, 4 plates and 8 bolts.
202	22.3.01	Kilometres 290.5 .. ..	4 lengths rails and 35 sleepers destroyed.
203	24.3.01	374 $\frac{3}{4}$ miles, Orange River Colony	3 24-foot rails, 2 plates, 4 bolts, and 1 sleeper blown up by dynamite.
204	25.3.01	Kilometres 340 $\frac{1}{2}$ .. ..	Bogie derailed. No damage to permanent way.

Item.	Date.	Locality.	Nature of Interruption.
205	26.3.01	345½ miles, Orange River Colony	Boers broke down gate and fence and placed them on crossings.
206	27.3.01	Kilometres 390 .. ..	7 rails blown out and 17 sleepers damaged by dynamite.
207	29.3.01	Kilometres 290 .. ..	3 rails and 8 sleepers blown out by dynamite.
208	29.3.01	Kilometres 30½ .. ..	Between Olifantsfontein and Kaalfontein. Line and train blown up. Engine thrown across line. One bogie smashed and 4 bogies burnt.
209	31.3.01	Near Jordan, Orange River Colony	Line blown up. 13 rails damaged.
210	31.3.01	Kilometres 172 .. ..	2 natives wounded by Boers.
211	2.4.01	Kilometres 310, Middelburg	Engine 109 and 6 trucks derailed. 6 rails and 5 sleepers blown out.
212	3.4.01	375 miles, Orange River Colony, near	Line blown up. 3 24-foot rails, 4 iron sleepers, and 4 fish-plates broken.
213	4.4.01	565 miles, Orange River Colony, near Geneva	19 30-foot rails, 6 pairs plates, 50 fish-bolts, and 30 iron sleepers damaged.
214	5.4.01	566 miles, near Boschrand	Line blown up. 13 rails damaged.
215	5.4.01	587½ miles, near America siding	Line blown up. 8 rails damaged.
216	5.4.01	519½ miles, near Theron	Rail removed. Train derailed.
217	6.4.01	Kilometres 336 Uitkyk ..	2 rails blown up.
218	6.4.01	Winburg branch .. ..	44 pairs rails removed and No. 3 cottage burnt.
219	7.4.01	Kilometres 234, Dalmanutha	Line blown up and one truck derailed.
220	7.4.01	Kilometres 234, Dalmanutha	15 metre bridge badly damaged. Traffic resumed 5 p.m. and train exploded mine, damaging engine.
221	7.4.01	Kilometres 293, near Pan	Line blown up. 130-foot rail broken and engine 165 had fire-bars displaced.
222	8.4.01	13½ miles, Winburg Branch, Orange River Colony	15 pairs rails taken out and turned over, and 120 fish-bolts broken
223	8.4.01	14½ miles, Winburg Branch, Orange River Colony	9-foot culvert set on fire, 2 baulks burnt, 2 lengths 30-foot rail taken out and thrown down bank, 24 fish-bolts broken
224	8.4.01	14 miles 30 chains ..	9-foot culvert set on fire.
225	11.4.01	Kilometres 350, Groot Olifants River	Engine derailed and train wrecked.
226	11.4.01	Kilometres 245½, between Belfast and Dalmanutha	Line blown up. Engine 127 and 3 trucks derailed.
227	13.4.01	588½ miles, near America siding	Line blown up. 8 rails and 10 iron sleepers damaged.
228	18.4.01	588 miles 50 chains, Orange River Colony, near America	Six 30-foot rails, 20 fish-bolts, 10 fish-plates, 11 iron sleepers damaged.
229	19.4.01	Kilometres 179, Nooitgedacht	Line blown up. 1 rail and 1 sleeper badly damaged, 2 engines damaged by rifle fire.

Item.	Date.	Locality.	Nature of Interruption.
230	24.4.01	566½ miles, Boschrand ..	Fish-plates removed from 1 rail, hospital train derailed, 8 length rails and sleepers destroyed.
231	26.4.01	610¾ miles, Roodeval ..	Line blown up. 4 rails damaged. Repaired 8.15 p.m.
232	26.4.01	620 miles, Leeuwspruit ..	Line blown up. 8 rails and 16 iron sleepers damaged. Repaired 9.30 a.m.
233	27.4.01	396¼ miles, Orange River Colony, near Pompei	Two joints slightly bent outwards, 4 fish-bolts broken.
234	30.4.01	588 miles, America siding	Line blown up. 14 rails and two sleepers damaged. Repaired 8 a.m.
235	30.4.01	Kilometres 40½, between Zuurfontein and Kaalfontein	Explosion of old mine laid by enemy. Ganger Hammond killed. Line slightly damaged. Repaired same day in two hours.
236	3.5.01	393 miles, near Pompei, Orange River Colony	Explosion. Nine 24-foot rails, 20 iron sleepers, 40 fish-plates and 40 fish-bolts damaged.
237	4.5.01	553½ miles, Ventersburg Road	Mine exploded under 35 Down train. 2 rails and 2 fish-plates damaged.
238	5.5.01	Kilometres 65½, near Florida	Ganger Simpson found fish-bolts and nuts removed. No delay.
239	5.5.01	Kilometres 334, near Uitkyk	Mine exploded. 2 rails and 3 sleepers damaged.
240	6.5.01	385¾ miles, near Kruger's	Mine exploded. 1 24-foot rail and 2 iron sleepers destroyed.
241	6.5.01	393 miles, near Pompei ..	Explosion. 1 24-foot rail and 1 wood sleeper damaged
242	9.5.01	Kilometres 389, near Wilge River	Explosion. 1 rail and 2 sleepers destroyed.
243	17.5.01	605¾ miles, near Serfontein	Mine exploded by No. 72 Up train. 2 rails and cow-catcher of engine damaged. No delay.
244	18.5.01	629¾ miles, near Vrededorf Road	Line blown up. 14 rails damaged
245	18.5.01	583 miles 42 chains, near America Siding, Orange River Colony	Mine exploded under armoured train. 1 truck derailed and 2 rails damaged. Major Heath killed.
246	19.5.01	649 miles, near Steenpan	2 30-foot rails, 2 fish-plates, 43 bolts, and 4 iron sleepers destroyed by dynamite.
247	20.5.01	Kilometres 151.5, near Elandshoek	Train No. 22 Up (engines 169 and 76), blown up by means of a wire pulled from place of concealment. Driver Fuijze killed, Fireman Johnston wounded, and 1 soldier killed.
248	7.6.01	394¾ miles, near Pompei ..	18 24-foot rails blown out.
249	8.6.01	396¼ miles, near Pompei ..	1 iron sleeper, 6 fish-plates, and 9 fish-bolts broken. Line blown up. 7 rails damaged.
250	19.6.01	Kilometres 213½, S.W. line	Fish-plate and line slewed by Boers, causing break in road. 20 of the 21 vehicles partially or totally destroyed by fire. 7 men killed, including driver and fireman.
251	25.6.01	19 miles 36 chains, Heilbron Branch, Orange River Colony	Contact mine exploded under leading truck of armoured train. Damage, 1 30-foot rail and 1 wooden sleeper.



Item.	Date.	Locality.	Nature of Interruption.
252	27.6.01	534 $\frac{1}{4}$ miles, near Virginia, Orange River Colony	4 Up exploded small charge dynamite. 2-feet rail blown out one side.
253	28.6.01	622 $\frac{1}{4}$ miles, near Leeuw-spruit Siding, Orange River Colony	Up passenger train blown up. Engine, 2 bogies, luggage wagons blown off line. Fireman Dale killed. 6 30-feet rails, 30 iron sleepers, 16 fish-plates and 24 fish-bolts destroyed.
254	29.6.01	Kilometres 326 $\frac{1}{2}$ , near Uitkyk	Armoured train blown up. Rail blown out. 3 soldiers injured.
255	4.7.01	Kilometres 176 $\frac{1}{2}$ , Naboom Spruit, Northern line	107 Down train derailed by explosion. Lieut. Best and 12 details killed; also driver, fireman, guard, and 2 foremen. Engine 92, piston rod broken, 1 V.C. burnt, 1 box truck burnt, 1 guard's van burnt, 1 V.L. (No. 8134) burnt, 1 V.L. (No. 36, P.P.S.M.) slightly burnt, and 1 V.L. (No. 1498) injured slightly.

## NATAL.

LIST OF BREAKS IN THE ROAD CAUSED BY ACTS OF THE ENEMY FROM  
JUNE, 1900, TO MAY, 1901.

Item.	Mileage.	Date of Break.	Description.
1	275 $\frac{1}{4}$ miles, between Newcastle and Ingogo.	13th August, 1900	3—30-feet rails, 78-lbs. type, and fastenings blown up by dynamite. Telegraph wire cut.
2	247 miles, between Dannhauser and Alcocks Spruit	21st August, 1900	8 rails, 78-lbs. type, 44 sleepers, 88 chairs, 264 coach screws, 88 keys, blown up by dynamite. Engine and 2 trucks derailed engine fell over on broadside.
3	274 $\frac{1}{2}$ miles, between Newcastle and Ingogo	21st August, 1900	5—30-feet rails, 78-lbs. type, 6 sleepers, 12 chairs, 36 screws, 12 keys damaged; line blown up by dynamite. Telegraph wires cut.
4	275 miles, between Newcastle and Ingogo	21st August, 1900	Culvert damaged by dynamite; 1—2-feet pipe blown off and 1 rail joint damaged.
5	Between 218 $\frac{1}{2}$ and 218 $\frac{3}{4}$ miles, near Waschbank	25th October, 1900	Road blown up in 4 places; station offices, ladies' waiting room, and goods shed at Waschbank burnt down.
6	296 $\frac{1}{4}$ miles near Mount ..	1st April, 1901	1 rail, 61-lbs. type, 10 sleepers, 10 chairs blown up while train on culvert. Engine and 1 truck entirely derailed. Two trucks released and allowed to run into Mount Prospect Station. Contents of trucks looted and burnt.

## ORANGE RIVER COLONY BRANCH.

7	243 $\frac{1}{2}$ miles, between Albertina and Harrismith	8th March, 1901	2—30-feet rails, 61-lbs. type, 7 iron sleepers, 1 pair fish-plates, 8 fish-plate bolts, blown up by dynamite.
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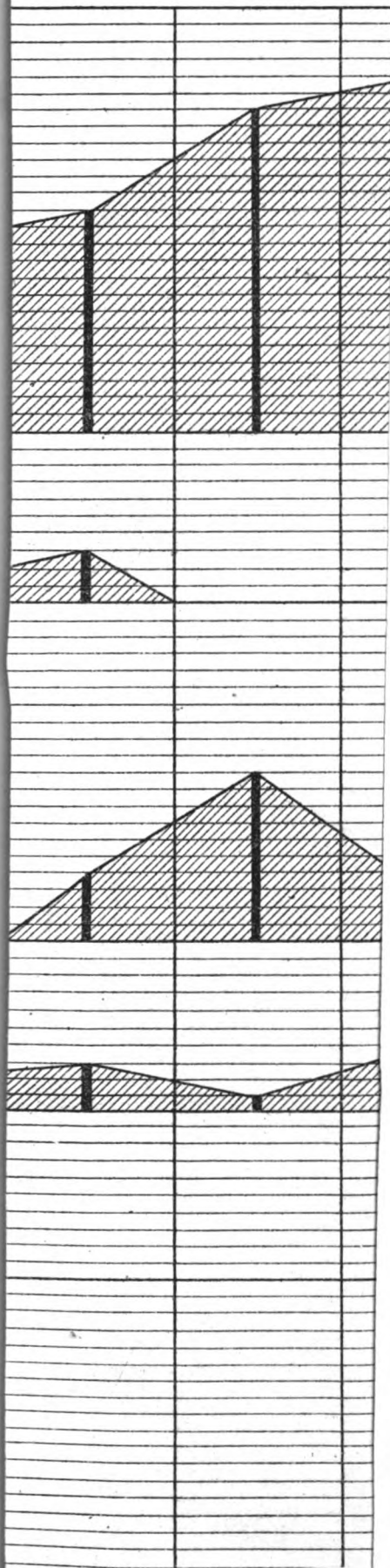
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1900

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ILLUST

190

SEA



## INDEX.

## VOLUME I.

									PAGE
ACCOUNTANT .. ..	Chief, Imperial Military Railways, appointment of ..								36, 63
ACCOUNTS .. ..	Between Army and railway .. ..								15, 23
	Department, Imperial Military Railways .. ..								63
ADVANCE .. ..	From Bloemfontein, Northwards .. ..								37, 48
	„ Kimberley to Mafeking .. ..								48
	„ Klerksdorp to Johannesburg .. ..								42
	„ Modder River to Kimberley .. ..								28
	„ Middelburg to Komati Poort .. ..								45
	„ Orange River to Modder River .. ..								28
	„ Pretoria to Middelburg .. ..								38, 43
	„ „ Pietersburg .. ..								38
	To Bethulie .. ..								29
	„ Norvals Pont .. ..								29
AGENTS .. ..	South African Railways, London, information supplied by ..								8
ARMOURED TRAINS ..	Assistant Director of Railways, appointment of ..								65
	„ „ „ duties of .. ..								65
	At commencement of campaign .. ..								64
	Guns mounted on trucks .. ..								65
	Misuse of .. ..								65
	Organisation and use of .. ..								65
ARMOURED TRUCKS ..	.. ..								67
BETHULIE BRIDGE ..	Railway, construction of temporary deviation .. ..								30
	„ destruction of .. ..								29
	Road, railway diverted over .. ..								30
BLOCK-HOUSES .. ..	.. ..								67
BLOCK INSTRUMENTS ..	Electric .. ..								61
BLOEMFONTEIN .. ..	Capture of .. ..								30
BLOEMFONTEIN STATION ..	.. ..								34
BRIDGE GUARDS .. ..	.. ..								67
BRIDGES, RAILWAY ..	Not to be used as road bridges .. ..								50
COAL .. ..	.. ..								21, 39, 59
COMMANDANTS .. ..	Line of communications, posts .. ..								11
	Station .. ..								23
COMPANIES, ROYAL ..	Detailed for railway work .. ..								8, 9
ENGINEER .. ..	„ „ „ arrival in South Africa .. ..								8
CONSTRUCTION .. ..	New .. ..								50
	Trains .. ..								48
CONTROL .. ..	Military, of friendly railways .. ..								10
DAMAGE TO RAILWAY ..	By enemy in Natal .. ..								16, 33
	„ on Imperial Military Railways .. ..								16, 37, 42, 44, 46, 48
	Interruptions due to enemy on all railways .. ..								129, 142
DEFENCE OF THE LINE ..	.. ..								67

								PAGE
<b>DIRECTOR OF RAILWAYS..</b>		Appointment of .. .. .						7
		Arrival at Cape Town .. .. .						8
		„ Johannesburg .. .. .						37
		Assistant Cape Government Railways, duties of ..						22
		„ for armoured trains .. .. .						65
		„ „ „ duties of.. .. .						65
		„ Lorenzo Marques .. .. .						64
		Deputy Assistant (Base), appointment of .. .. .						37
		„ „ Cape Government Railways, appoint- ment of .. .. .						22
		Deputy Assistant, Cape Government Railways, duties of ..						23
		„ „ on Staff of General Officer Command- ing advancing force .. .. .						57
		Visit to Natal .. .. .						32
<b>DISTANCES .. ..</b>		Principal military stations from base ports .. .. .						68
<b>DRIVERS .. ..</b>		Engine, gallant behaviour of .. .. .						56
<b>ELANDSFONTEIN .. ..</b>		Capture of .. .. .						40
<b>EMPLOYÉS .. ..</b>		British Railway, from Orange Free State, working with field sections .. .. .						27
		British Railway, in Orange Free State .. .. .						8
		„ „ „ „ actions of .. .. .						36
		„ „ „ „ status of .. .. .						36
		„ „ „ „ suspension of .. .. .						36
		Heads of Departments .. .. .						36
		From Cape Government Railways handed over to Imperial Military Railways .. .. .						36
<b>EMPLOYMENT OFFICE .. ..</b>		Cape Town .. .. .						63
<b>ENGAGEMENTS .. ..</b>		With the enemy .. .. .						49, 67
<b>ENTRY .. ..</b>		Into Orange Free State, railway personnel, proceed towards Paardeberg and return .. .. .						29
		Into Transvaal .. .. .						39
<b>EXPERIENCE GAINED .. ..</b>		Locomotive department, water supply .. .. .						56
		„ „ rolling stock .. .. .						56
		Reconstruction .. .. .						50
		„ in hands of Royal Engineers .. .. .						50
		„ railway bridges as road bridges.. .. .						50
		Traffic .. .. .						61
		„ electric block instruments.. .. .						61
		„ method of train crossings .. .. .						61
		„ necessity for registration of employés in peace.. .. .						61
		„ on field railway sections .. .. .						61
		„ proper organisation during advance .. .. .						61
		„ removal of rolling stock .. .. .						61
		„ time tables .. .. .						61
<b>FIREMEN .. ..</b>		Gallant behaviour of .. .. .						56
<b>GIRDERS .. ..</b>		Ordered in England, October, 1899 .. .. .						8, 49
		Repair of .. .. .						49
<b>GLEN BRIDGE .. ..</b>		Destruction of .. .. .						35
		Deviation at.. .. .						35
<b>GUNS .. ..</b>		Mounted on trucks.. .. .						45
<b>INTERFERENCE .. ..</b>		With civil staff by the army .. .. .						10-15
		„ „ „ a typical case .. .. .						21
<b>IRENE BRIDGE .. ..</b>		Repair of .. .. .						49
<b>JOHANNESBURG .. ..</b>		Capture of .. .. .						40
		Traffic from Cape re-opened .. .. .						37
		„ Natal „ .. .. .						38



									PAGE
KLERKSDORP	..	..	Traffic with Johannesburg re-opened	..	..	..	..	..	38
KOMATIPOORT	..	..	Capture of	..	..	..	..	..	45
			Extensive damage to rolling stock by enemy	..	..	..	..	..	46
			Traffic opened to	..	..	..	..	..	46
KROONSTAD	..	..	Deviation	..	..	..	..	..	48
LABOUR	..	..	Depôt, army, creation of, necessity for	..	..	..	..	..	66
			" " organization of	..	..	..	..	..	66
LOCOMOTIVE	....	..	Department, Imperial Military Railways, conclusions	..					56
			" " " " creation of	..					51
			" " " " head - quarters						
			moved to Pretoria	..	..	..	..	..	51
			Department, Imperial Military Railways, summary of						
			work	..	..	..	..	..	56
			Department, Imperial Military Railways, work in ad-						
			vance from Bloemfontein	..	..	..	..	..	37
			Department, Imperial Military Railways, work in Orange						
			River Colony	..	..	..	..	..	51
			Department, Imperial Military Railways, work in Orange						
			River Colony, temporary work following army	..					51
			Department, Imperial Military Railways, work in						
			Transvaal..	..	..	..	..	..	51
			Department, Imperial Military Railways, work in						
			Transvaal, taking over Transvaal Railways	..	..				51
			Department, Imperial Military Railways, work in						
			Transvaal, temporary work following army	..	..				52
			Department, Imperial Military Railways, work of	..					51-56
			Superintendent, appointment of	..	..	..	..	..	36, 51
LORENÇO MARQUES	..		Traffic opened with..	..	..	..	..	..	46
MEDICAL	..	..	Department, railway	..	..	..	..	..	63
MIDDELBERG	..	..	Traffic with Pretoria re-opened	..	..	..	..	..	43
MINES	..	..	On railway	..	..	..	..	..	67
MOVEMENTS BY RAIL	..		Troop, big strategic	..	..	..	..	..	10, 21, 25
			" effect on railway	..	..	..	..	..	21
			" from Kroonstad to Krugersdorp in July, 1900..						42
			" " Pretoria to Belfast in August, 1900	..					44
			" in Natal	..	..	..	..	..	16
			" necessitated by guerilla warfare	..	..	..	..	..	21
			" short..	..	..	..	..	..	11, 21
			Troops, Lord Roberts' concentration on Modder River						25
			" and stores, to the front	..	..	..	..	..	24
NORVALS PONT	..	..	Permanent repair	..	..	..	..	..	30
			Temporary reconstruction..	..	..	..	..	..	30
OFFICERS	..	..	Railway staff, at railhead	..	..	..	..	..	34
			" " duties of	..	..	..	..	..	24
			" " in Transvaal	..	..	..	..	..	41
			" " necessarily under Director of Railways..						23
			" " necessity for railway knowledge..	..					23
			" " where appointed	..	..	..	..	..	23
ORDERS	..	..	Army, affecting railway working, some extracts	..					69-82
			To railway staff, by whom given	..	..	..	..	..	15
ORGANIZATION	..	..	Director of Railways department	..	..	..	..	..	47
			Existing, military railway	..	..	..	..	..	7
			For control of Cape Government Railways	..	..				22
PAY	..	..	Of soldiers on Imperial Military Railways	..	..				41, 52
PERSONNEL	..	..	Asked for by Director of Railways	..	..	..	..	..	7

	PAGE
PIONEER REGIMENT .. Railway, duties of .. .. .	30
„ formation of .. .. .	30
„ organisation of .. .. .	30
„ proper rôle of .. .. .	50
„ summary of work .. .. .	49
„ work at Bethulie .. .. .	30
„ „ „ Norvals Pont .. .. .	30
„ „ from Rosmead to Stormberg .. .. .	29
POLICE .. .. Railway .. .. .	64
PRETORIA.. .. Capture of .. .. .	41
„ Traffic re-opened to .. .. .	41
RAILWAY .. .. Rack .. .. .	45
RAILWAYS .. .. Cape Government .. .. .	21-31
„ „ general description of.. .. .	21
Held by the enemy in 1899 .. .. .	9
Imperial Military, cardinal point in organization .. .. .	34
„ „ creation of, at Bloemfontein.. .. .	33
„ „ head-quarters moved to Johannesburg .. .. .	37
„ „ summary of organization .. .. .	36
Natal Government .. .. .	31-33
„ „ arrangements for control of .. .. .	32
„ „ difference from arrangements with Cape Government Railways .. .. .	32
Natal Government, general description of .. .. .	31
„ „ value of .. .. .	32
New .. .. .	50
„ Bloemfontein to Ladybrand.. .. .	50
„ Harrismith to Bethlehem .. .. .	50
„ Vereeniging to Elandsfontein .. .. .	50
South Africa, general description of .. .. .	9
„ „ mileage of .. .. .	9
Transvaal, narrative of taking over .. .. .	39-47
„ incorporated with Imperial Military Railways .. .. .	37
„ taken over by Director of Railways.. .. .	37
Working of, difference in peace and in war .. .. .	10
„ during Franco-Prussian War .. .. .	12-15
„ „ Russo-Turkish War .. .. .	15
„ „ war, M. Jacqmin's Book, extracts from .. .. .	12-14
Working of, during war, Railway Magazine, extracts from .. .. .	14
„ „ „ regulations in Austria .. .. .	13
„ „ „ „ Germany .. .. .	13
RECONSTRUCTION .. .. Cape Government Railways .. .. .	26
„ „ „ general principles .. .. .	26
„ „ „ necessarily in hands of Royal Engineers.. .. .	26, 50
Experience gained .. .. .	50
In Transvaal .. .. .	49
Natal Government Railways .. .. .	31
„ „ „ arrangements with General Manager .. .. .	32
Of railways, general principles .. .. .	47
„ temporary .. .. .	10
„ „ in Orange River Colony .. .. .	48, 49
On advance to Komatipoort .. .. .	45
„ „ Middelberg .. .. .	43
„ „ Pietersburg .. .. .	44
Permanent .. .. .	49, 50

	PAGE
RECONSTRUCTION (contd.)	
Semi-permanent and permanent, in Orange River Colony	49
Summary of work .. .. .	49
Temporary, from Modder River to Kimberley .. ..	29
"    "    Molteno to Bethulie, Rosmead to Stormberg, Naauwpoort to Norvals Pont .. ..	29
Temporary, from Molteno to Bethulie, work of 12th Field Company, Royal Engineers .. .. .	29
Temporary, from Orange River to Modder River .. ..	28
Tables showing details of repairs to all railways .. ..	83-128
ROBERTS, LORD .. .. .	25
ROLLING STOCK .. .. .	35, 44
"    "    Natal Government Railways .. ..	44
Captured at Avoca .. .. .	45
"    "    Barberton .. .. .	45
"    "    Bloemfontein .. .. .	30, 35
"    "    Elandsfontein.. .. .	40
"    "    Johannesburg.. .. .	40
"    "    Kaapmuiden .. .. .	45
"    "    Komati Poort.. .. .	46
"    "    Nelspruit .. .. .	45
"    "    Pretoria .. .. .	41
"    by enemy, table of .. .. .	53
Damage by enemy .. .. .	46, 55
Recaptured from enemy .. .. .	54
Removal by enemy .. .. .	37, 41, 53, 57
Repaired .. .. .	55
Necessity for ordering new stock.. .. .	56
New, ordered and erected .. .. .	53, 55, 58
Shortage of .. .. .	39, 44, 56
Suitability for military purposes .. .. .	56
SECTIONS .. .. .	48, 57, 61
Field railway, abolition of.. .. .	28
"    "    duties of Assistant Director of Railways .. ..	27
"    "    Midland .. .. .	28
"    "    "    arrival at Naauwpoort .. ..	27
"    "    "    creation of .. .. .	27
"    "    "    staff and personnel .. ..	29
"    "    "    work at Norvals Pont .. ..	29
"    "    "    "    on advance to Kimberley.. ..	29
"    "    "    "    "    Norvals Pont .. ..	27
"    "    "    "    "    Western .. .. .	27
"    "    "    "    "    creation of .. .. .	27
"    "    "    "    "    staff and personnel .. ..	27
"    "    "    "    "    work on advance to Kimberley .. ..	29
SITUATION .. .. .	34, 35
At Bloemfontein, March, 1900 .. .. .	9
General, South African Railways .. .. .	39
Railway, June, 1900 .. .. .	9
"    November, 1899.. .. .	40
"    on arrival at Pretoria .. .. .	10-21
STAFF .. .. .	10
Controlling, military .. .. .	22-25
"    "    approved by Commander-in-Chief .. ..	22
"    "    Cape Government Railways .. ..	15
"    "    "    "    "    "    appoint- ment of Assistant Director of Railways .. ..	34-36
Controlling, military, Cape Government Railways, approval of General Manager and Chief Traffic Manager .. .. .	34
Controlling, military, for Imperial Military Railways .. ..	
"    "    "    "    "    "    ap- pointment of personnel.. .. .	

	PAGE
STAFF (contd.) .. ..	
Controlling, military, for Imperial Military Railways, necessity for .. .. .	34
Controlling, military, for Imperial Military Railways, re-organization on arrival at Johannesburg .. ..	38
Controlling, military, in Natal .. .. .	31
"    "    necessity for .. .. .	32
"    "    Natal Government Railways .. ..	32
"    "    "    "    "    "    ap- pointment of Assistant Director of Railways .. ..	31
Controlling, military, regulations for, evolution of .. ..	16
Depôt, railway, formation of, object of, &c. .. ..	38, 41, 63
Netherlands Railway, deportation of .. .. .	37
"    "    hostility of officials .. .. .	37, 40
Technical working, for Imperial Military Railways, how obtained .. .. .	38, 41, 52, 58
Technical working, for Imperial Military Railways, organization of .. .. .	36
Technical working, registration in peace .. .. .	52, 61
"    "    re-organisation on head-quarters moving to Johannesburg .. .. .	37, 38
Technical working, union with military staff .. ..	12, 14
STATION .. .. .	28
STOREKEEPER .. .. .	36
Chief, Imperial Military Railways, appointment of .. ..	28
For Director of Railways, appointment of .. ..	28
STORES .. .. .	28
Available in South Africa .. .. .	28
Contracts for .. .. .	28
Department, Cape Government Railways .. .. .	63
"    Imperial Military Railways .. .. .	28
"    Railway .. .. .	8
Ordered in England, October, 1899 .. .. .	28
Railway, advance depôt .. .. .	45
"    captured at Krokodil Poort .. .. .	36
Supplied to railhead .. .. .	36, 62
SUPERINTENDENT.. ..	36, 47
Of railway telegraphs, Imperial Military Railways, appointment of .. .. .	37
Of works, Imperial Military Railways, appointment of .. ..	62
TELEGRAPH .. .. .	62
Damage done by enemy north of Bloemfontein.. ..	36, 62
Railway department .. .. .	62
"    "    appointment of Superintendent .. ..	62
"    "    creation of and necessity for .. ..	62
"    "    work of .. .. .	62
TRAFFIC .. .. .	42
At night .. .. .	42
Between Bloemfontein and Transvaal in June, 1900 .. ..	56
Department, Imperial Military Railways .. .. .	56
"    "    "    "    "    creation of .. ..	58
"    "    "    "    "    head-quarters removed to Johannesburg .. .. .	58
Department, Imperial Military Railways, restarting Transvaal Railways .. .. .	59
Department, Imperial Military Railways, summary of work .. .. .	57
Department, Imperial Military Railways, temporary arrangements, following army .. .. .	37
Department, work in advance from Bloemfontein .. ..	37
Entirely in hands of civilian staff .. .. .	61
Experience gained .. .. .	46
From Komati Poort to Pretoria, September and October, 1900 .. .. .	

									PAGE
TRAFFIC (contd.)	..	Into Bloemfontein, March and April, 1900	..	..	..	..	..	..	36
		Manager, Imperial Military Railways, appointment of..							36
		Military, on Cape Government Railways	..	..	..	..	..	..	25
		„ from ports	..	..	..	..	..	..	60
		On field sections	..	..	..	..	..	..	57, 61
		„ Natal Government Railways	..	..	..	..	..	..	32
		Regulations necessary for precedence of stores..	..	..	..	..	..	..	36, 42
		Working of, on hostile lines captured from the enemy..							26
		„ „ recaptured lines, Cape Government Railways	..	..	..	..	..	..	26
TRAM	..	Aerial, at Norvals Pont	..	..	..	..	..	..	30
TRUCKS	..	Kept under load	..	..	..	..	..	..	11, 23, 24
VAAL RIVER BRIDGE	..	Destruction of, by the enemy	..	..	..	..	..	..	39
		Low level deviation	..	..	..	..	..	..	39
WATER SUPPLY	..	At Bloemfontein, destruction of	..	..	..	..	..	..	35
		„ temporary arrangements	..	..	..	..	..	..	35
		Damage to, in Orange River Colony	..	..	..	..	..	..	48, 52
		Importance of rapid repairs	..	..	..	..	..	..	56
		On Pretoria-Komati Poort Line during advance	..	..	..	..	..	..	44
		Temporary expedients	..	..	..	..	..	..	56
WORKING..	..	Of hostile railways..	..	..	..	..	..	..	10
WORKS	..	Department, Imperial Military Railways, creation of	..	..	..	..	..	..	47
		„ „ „ „ officerto accom-							
		pany advance	..	..	..	..	..	..	48
		Department, Imperial Military Railways, situation on taking over	..	..	..	..	..	..	47
		Department, Imperial Military Railways, work of	..	..	..	..	..	..	47
WORKSHOPS	..	Bloemfontein	..	..	..	..	..	..	51
		Johannesburg	..	..	..	..	..	..	51, 53
		Pretoria	..	..	..	..	..	..	51, 53
		Waterval Boven	..	..	..	..	..	..	1
ZUIKERBOSCH BRIDGE	..	Repair of	..	..	..	..	..	..	49





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315 History of the  
S7G4 railways



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